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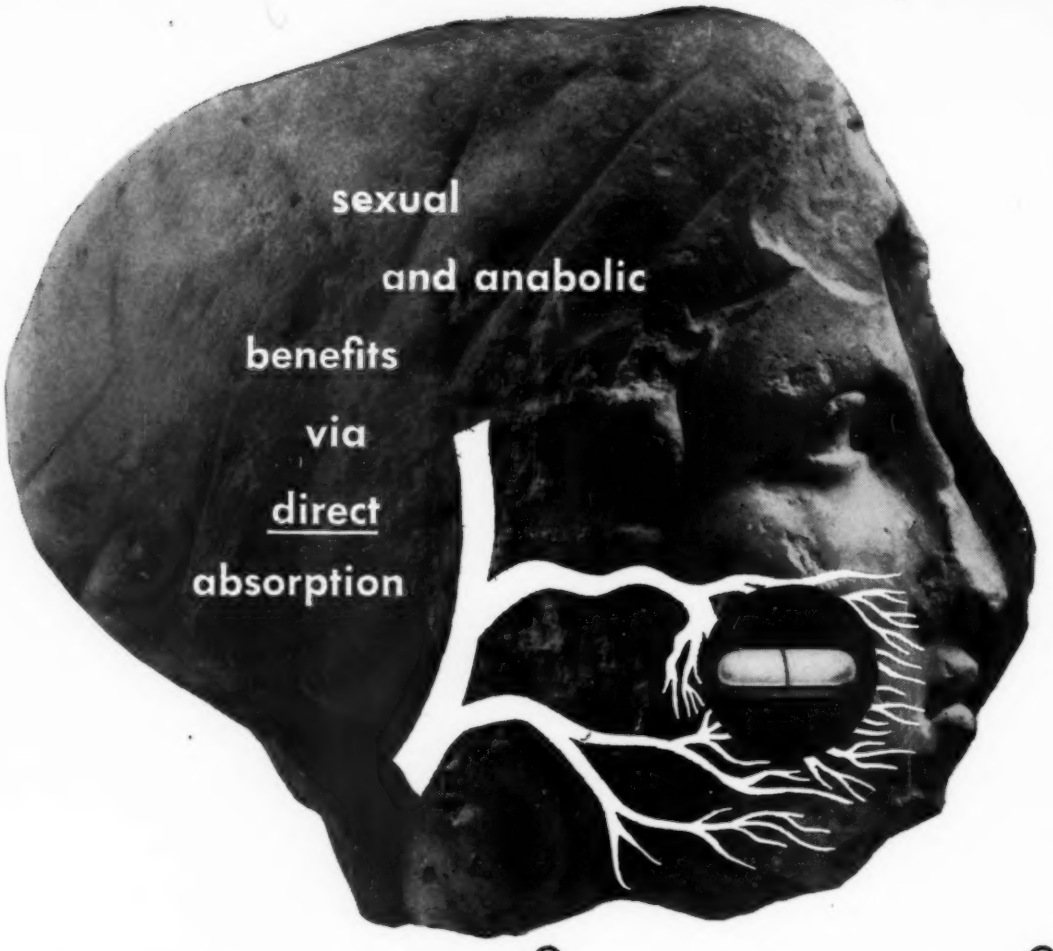

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CHEMOPALLIDECTOMY: A NEUROSURGICAL TECHNIQUE USEFUL IN GERIATRIC PARKINSONIANS*

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In April 1953, surgical occlusion of the anterior choroidal artery was reported as a new technique in the neurosurgical treatment of hyperkinetic disorders (1). A two-year follow-up evaluation of a series of 40 cases of anterior choroidal artery occlusion was reported in this Journal one year ago (2). At that time it was demonstrated that surgical occlusion of the anterior choroidal artery in selected cases of parkinsonism can alleviate resting tremor and cogwheel rigidity in the extremities contralateral to operation. Moreover, advanced disability, masked facies, propulsion and retropulsion, and deformities were improved in certain cases following this procedure. It was noted, however, that the operation of anterior choroidal artery occlusion should be limited to patients under the age of 55, since the hazards attendant upon occlusion of this artery are greater in older subjects.

Follow-up studies on the earliest successful cases of anterior choroidal artery occlusion have now been carried out for a period of three full years. These studies demonstrate that, in this series of cases, patients who were markedly improved by operation have maintained such improvement up to the present time. Thus, there is evidence that neurosurgical intervention can alleviate parkinsonian tremor and rigidity as well as other stigmata of parkinsonism without sacrifice of motor power, and that the beneficial results may be enduring.

The salutary effects of anterior choroidal artery occlusion in patients under the age of 55 led us to seek a means of producing similar results in the older age group of parkinsonian patients, with procedures which would not carry a great risk. Studies over the past two years have led to the development of a technique which appears to fulfill this need (3, 4). This technique, which has

* Aided by grants from the Allen P. and Josephine Green Foundation and from the William Hale Harkness Foundation.

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been named chemopallidectomy, involves destruction of the mesial portion of the globus pallidus by injection of absolute alcohol intracerebrally. It is the purpose of this report to describe this new procedure and specifically to indicate its possible usefulness in geriatric parkinsonians.

RATIONALE OF OPERATION

During the past two decades neurosurgeons have directed considerable attention towards the development of surgical techniques which might alleviate the symptoms of parkinsonism. For the most part these operations have involved interruption of the pyramidal tract either at the level of the cerebral cortex, cerebral peduncle, or spinal cord. These operations were capable of relieving tremor only to a degree proportional to sacrifice of motor power of the involved extremities. Therefore, operations aimed at the pyramidal tract have extremely limited usefulness.

During the past ten years operations have been developed which have been aimed at the basal ganglia. This era of basal ganglion surgery was initiated by the work of Meyers (5), who experimented with a transventricular approach to the pallidofugal fibers, as well as with other transventricular procedures. Meyers' experience with these operations led him to conclude that the risks of transventricular surgery are too great to warrant the general use of this approach. However, his contributions led to new concepts and a better understanding of the pathologic physiology of tremor and rigidity.

In recent years several investigators have devised procedures which are aimed at the basal ganglia (6–9). Review of these surgical techniques demonstrates that of all surgical methods for the alleviation of parkinsonism, the most successful are those which have attacked, at least in part, either the globus pallidus or its efferent pathways. Moreover, the principal site of infarction following anterior choroidal artery occlusion is in the mesial globus pallidus. Therefore, it is apparent that a marked alleviation of both tremor and rigidity may follow the destruction of this area.

There is considerable reason to believe that the globus pallidus exerts an excitory or facilitory influence on motor activity, which is initiated by the cerebral cortex and mediated by the pyramidal tract. The operation of chemopallidectomy is directed towards the destruction of the mesial globus pallidus.

OPERATIVE TECHNIQUE

If one draws a line, in a plane which is 1 centimeter anterior to the external auditory meatus, from the zygoma to the top of the third ventricle, this line invariably passes the mesial globus pallidus (Fig. 1). The plane designated by this line, AB, is employed in the technique of chemopallidectomy.

In order to locate this plane in a given patient, pneumoencephalography is performed prior to operation. Thirty cubic centimeters of air is injected into the lumbar subarachnoid space after the patient is placed in a sitting position. This amount of air will rise to fill the lateral and third ventricles and permit them to be visualized radiographically.

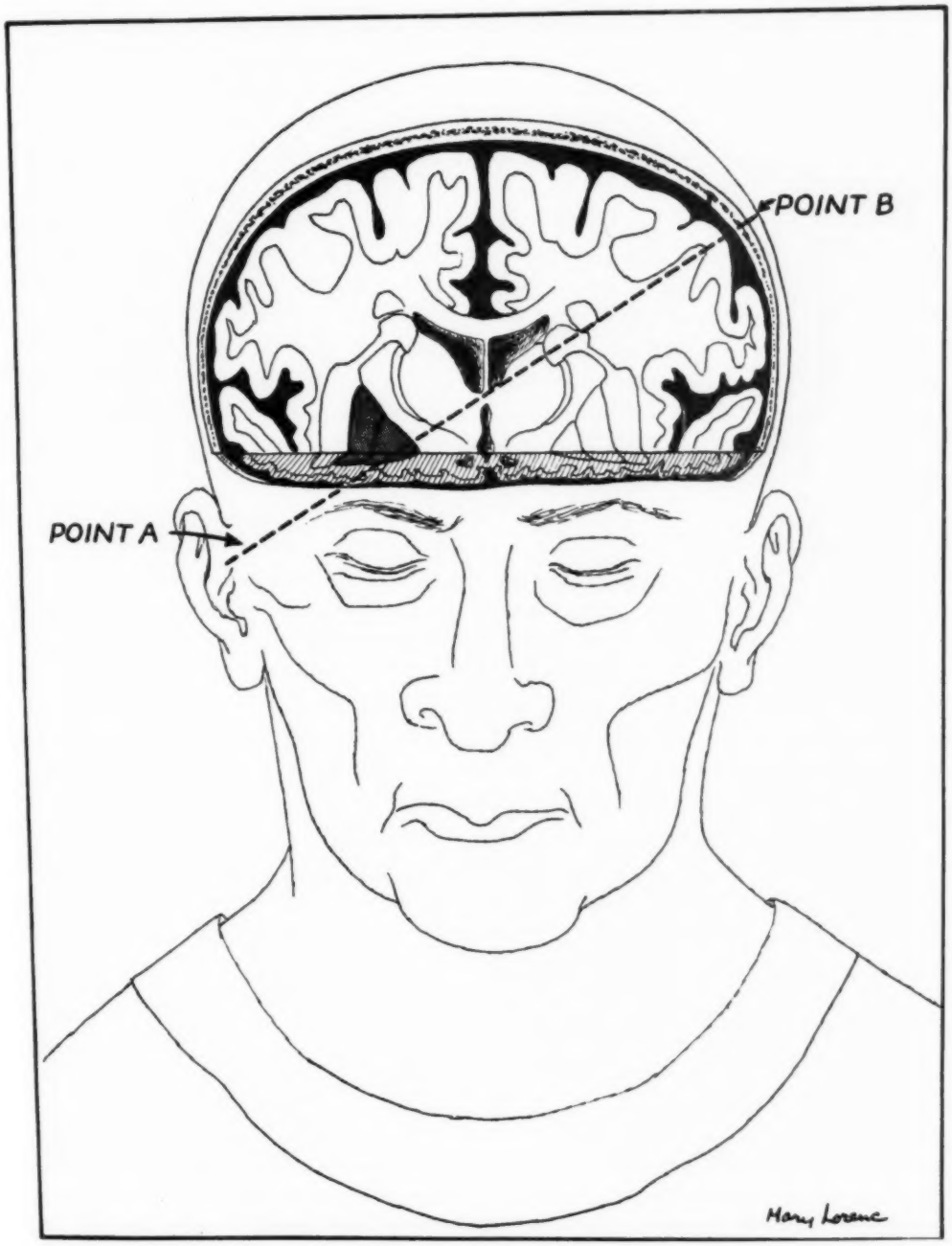

FIG. 1. A line drawn from a point immediately above the zygoma, anterior to the top of the third ventricle, invariably traverses the globus pallidus. This line indicates the plane which is used for direct globus pallidus puncture.

Prior to radiography, two radiopaque landmarks are placed on the scalp—one at the site of the proposed trephine (point A), and the other 9 centimeters from the midline on the contralateral side (point B). These landmarks are placed on a line which is dropped vertically to the zygoma from a point 14 centimeters behind the nasion (line C). This latter line is marked with a strip of tantalum so that it, too, will be radiopaque.

Antero-posterior and lateral radiographs are made after the landmarks are in place on the scalp. On the antero-posterior film a line drawn between landmarks A and B will usually pass immediately above the third ventricle and thus indicate the proper plane of cerebral puncture. If this line does not fall in the proper plane, landmark B is moved and more radiographs are made until *a line joining points A and B indicates the proper plane of puncture in the coronal plane* (Fig. 2).

When the lateral radiograph is made, the radiopaque line C will usually be on a plane 5 millimeters behind the foramen of Munro. If it is not, the tantalum marker is moved an appropriate distance and the radiograph is repeated. When the tantalum line is seen to lie 5 millimeters behind the foramen of Munro, then *line C indicates the proper site of cerebral puncture in the sagittal plane* (Fig. 3). Following this procedure the patient is taken to the operating room.

The patient is placed in an operative chair which has been developed specifically for this procedure (Fig. 4). The attached cassette holders facilitate the use of roentgenography during the operation. The patient remains in a sitting position throughout the procedure. Points A and B are marked on the scalp by small transverse scratches in the skin so that they may be readily recognized during the operation. Line C is also scratched on the scalp so that it will remain in view during the procedure (Fig. 5).

The operation is performed under local anesthesia. This is mandatory, since the operation reaches its end-point when tremor and rigidity have been relieved. Thus, it is necessary for the patient to be awake, cooperative and free of any sedation throughout the procedure.

An incision 5 centimeters in length is made at the lower end of line C which extends down to the zygoma (Fig. 6). The trephine opening is then made at a point in the skull which corresponds to landmark A.

At this point, a special polyethylene needle guide is placed on the patient's head. This instrument, which is made of aluminum and weighs 6 ounces, has been developed to facilitate placement of a polyethylene cannula[1] directly into the globus pallidus (Figs. 7 and 8). The pallidectomy guide[2] is placed in proper position on the patient's head by fixing the screw contralateral to the needle holder at point B. Holding this firmly in place, the needle holder on the pallidectomy guide is placed opposite the trephine opening. All three screws which maintain the instrument on the patient's head are then tightened into the scalp (Fig. 9). Once the pallidectomy guide is fixed in place, a line drawn be-

[1] This special polyethylene brain cannula is available from the American Cystoscope Makers, Inc., New York, N. Y.

[2] The pallidectomy guide is manufactured by Arnold S. J. Lee-Kenneth B. Morris, Belmar, N. J.

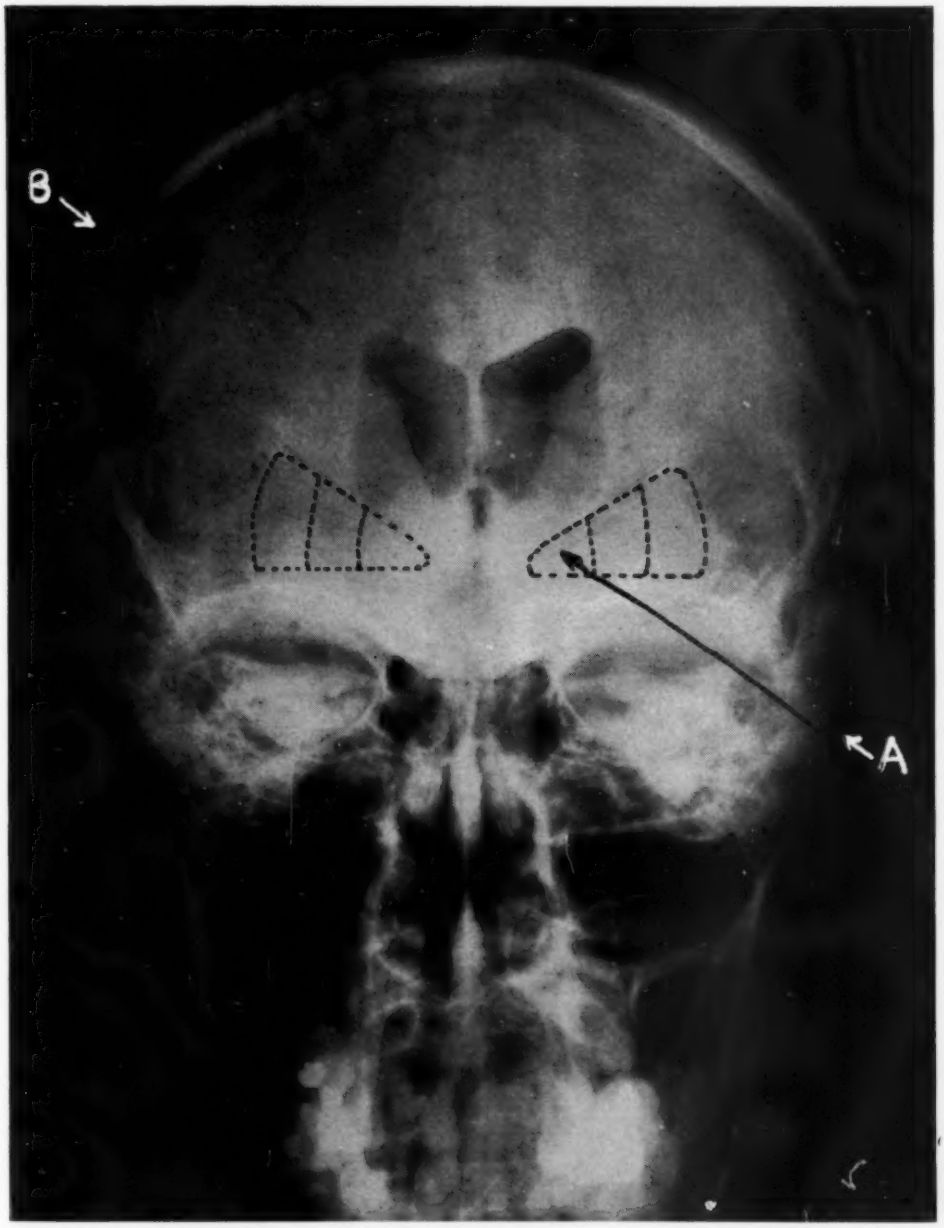

FIG. 2. Pneumoencephalogram demonstrating sites of external landmarks which are utilized to indicate the proper plane of cerebral puncture for globus pallidus projection. The globus pallidus and putamen have been drawn on this pneumoencephalogram and are indicated by the dotted line. This demonstrates that line AB traverses the mesial globus pallidus.

tween the needle holder and the contralateral screw should theoretically coincide with line AB in the preoperative pneumoencephalogram. *Thus, the needle holder is aimed directly at the mesial globus pallidus.*

The special polyethylene cannula with a stainless-steel stylet, which has

FIG. 3. Lateral pneumoencephalogram demonstrating line C, which indicates the proper site of cerebral puncture in the sagittal plane.

been developed for this operation, is placed in the needle holder and advanced as far as the cerebral cortex. At this point, an antero-posterior roentgenogram is made. Before inserting the cannula farther into the brain, the roentgenogram is checked (Fig. 10). A line is drawn on this x-ray film, between the tip of the cannula and point B. If this line passes immediately above the top of the third ventricle, then the cannula will enter the globus pallidus if it is projected in this plane 4.5 centimeters beyond the cerebral cortex. If on the other hand, the roentgenogram indicates that the proper plane has not been designated by the line drawn on the x-ray film, the pallidectomy guide is repositioned and another roentgenographic check is made. The instrument is adjusted until radiography confirms the fact that the needle holder is aimed directly at the top of the third ventricle.

FIG. 4. The patient is placed in an operative chair. This chair has attached cassette holders which facilitate roentgenography during operation.

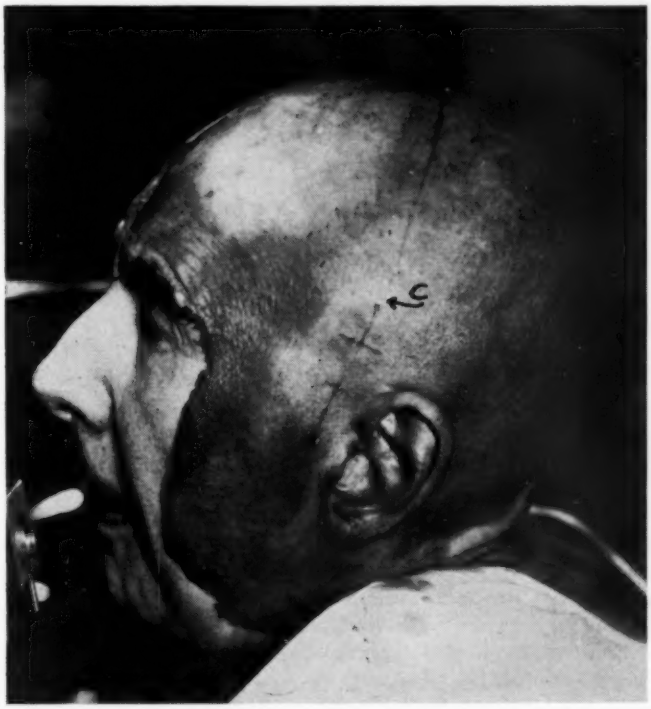

FIG. 5. Line C is scratched on the scalp so that it will be visible throughout the operative procedure.

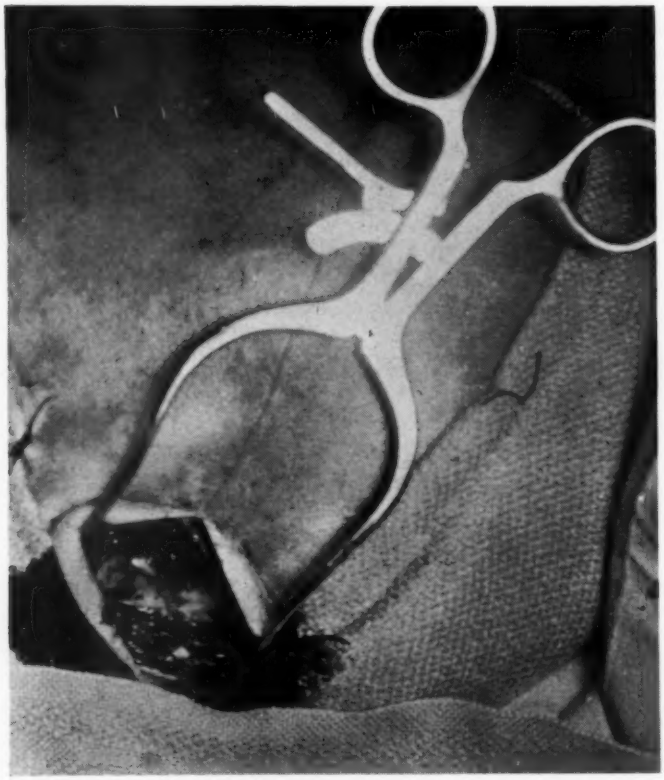

FIG. 6. A trephine opening is made at a point in the skull which corresponds to landmark A.

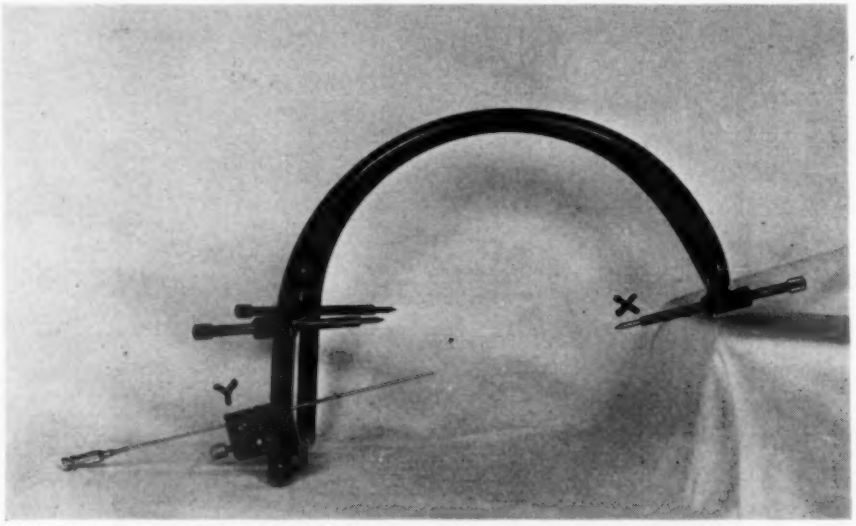

FIG. 7. Pallidectomy guide which is used to direct a polyethylene catheter into the globus pallidus. This instrument is made of aluminum and weighs 6 ounces. The guide is placed on the head so that the screw holder marked X is inserted into the point indicated in earlier drawings as landmark B. The needle guide marked Y is placed opposite the trephine opening at point A. When the pallidectomy guide has been properly placed on these points, a line drawn between the needle guide and screw holder X will correspond with line AB. The polyethylene catheter inserted through the needle guide is then aimed directly at the globus pallidus.

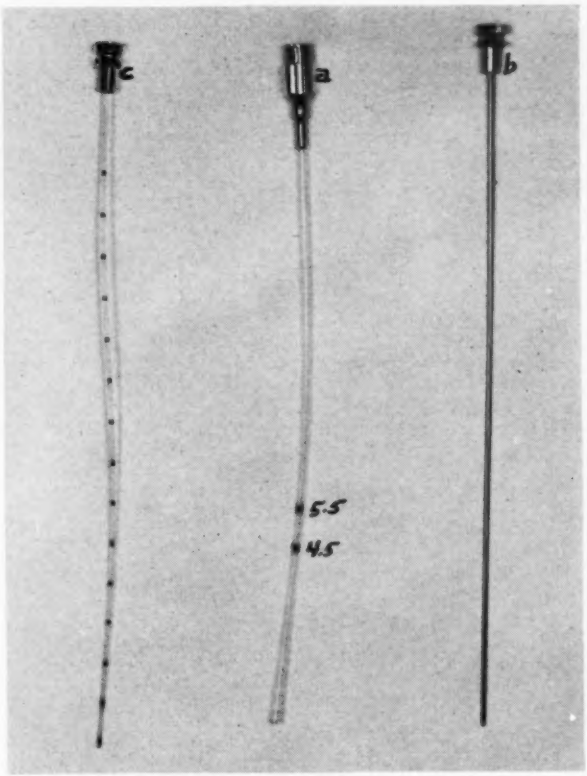

FIG. 8. Special polyethylene cannula (a) which is used in this operation. It is marked at 4.5 and 5.5 centimeters from its tip, to aid in marking the depth of insertion into the cerebral hemisphere. Solid stylet (b) is used during insertion of the cannula. The polyethylene stylet (c) with radiopaque markings at every centimeter replaces the fixed stylet prior to completion of the operation. This permits retention of the cannula in the brain for several days following operation. At the same time, the radiopaque markings on the polyethylene stylet permit radiographic check on the postoperative position of the cannul a

The cannula is advanced through the cerebral cortex to a depth 4.5 centimeters beyond the cortex (Figs. 11 and 12). Its position is again checked roentgenographically (Fig. 13). If the tip of the cannula is seen to lie in a position which past experience indicates as being that of the globus pallidus, 0.25 cubic centimeter of 1 per cent procaine is injected into the brain (Fig. 14). If localization of the cannula has been accurate, the injection of procaine will be followed by immediate lessening or abolition of tremor and rigidity in the contralateral extremities. If tremor and rigidity are not alleviated, the cannula is advanced to a depth of 5 centimeters and the injection is repeated. If neither of these injections produces alleviation of tremor and rigidity, the cannula must then be replaced in an anterior or more posterior plane in an attempt to localize the proper intracerebral site for operation. The repositioning of the cannula necessarily depends upon past surgical experience with this particular technique.

Once procaine injection has produced alleviation of contralateral tremor and rigidity, one proceeds to carry out the destructive lesion in this subcortical site. The method which we have used principally in this destruction is the injection

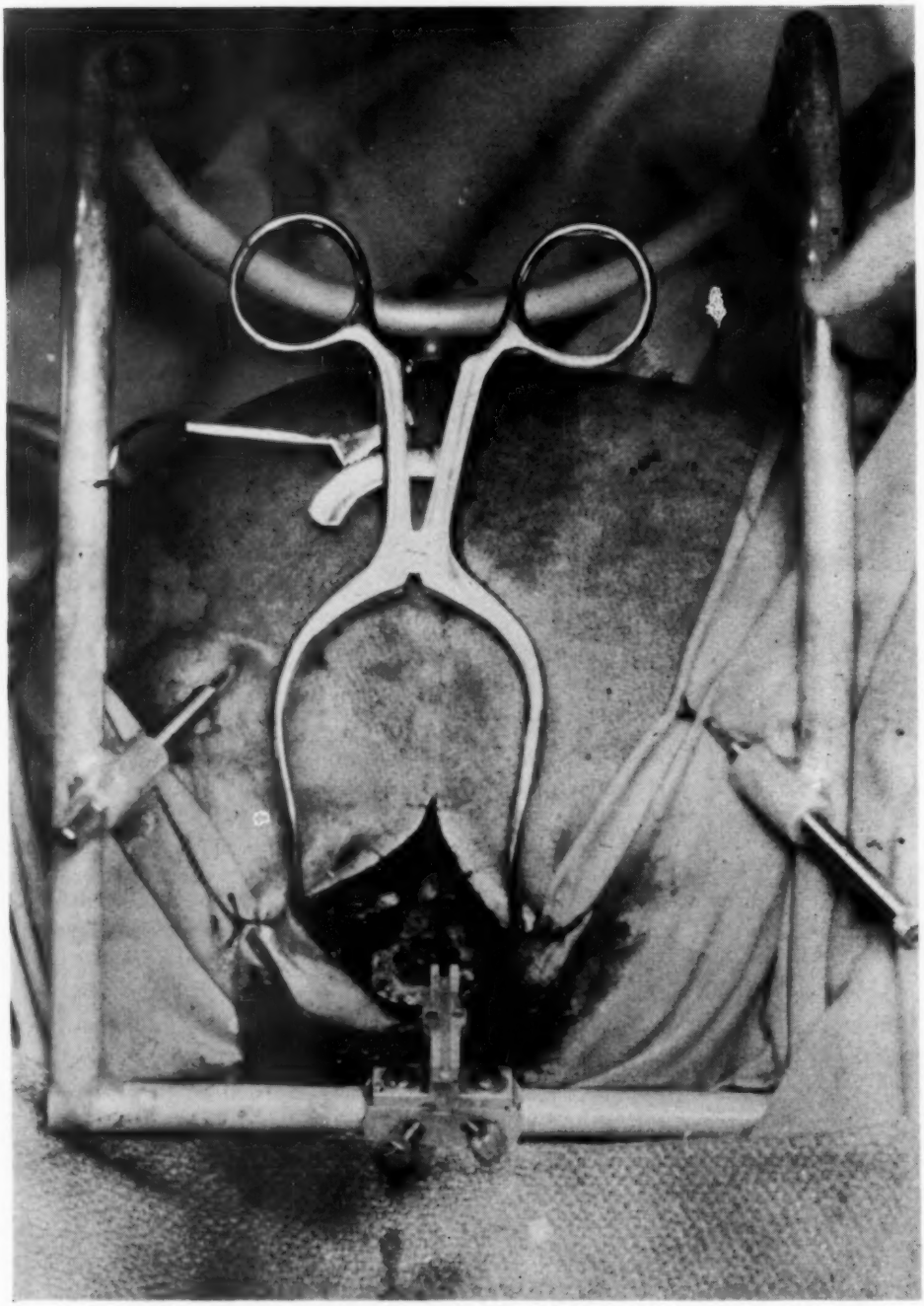

FIG. 9. Lateral view of the pallidectomy guide placed on the patient's head prior to insertion of the cannula. The screw holder X has been placed at landmark B.

of absolute alcohol. The injection of 0.75 cubic centimeter of absolute alcohol through the polyethylene cannula is performed slowly, over a period of about twenty minutes (Fig. 15). During the injection it is possible to examine the contralateral extremities, as well as other sensory or motor functions (Fig. 16). If

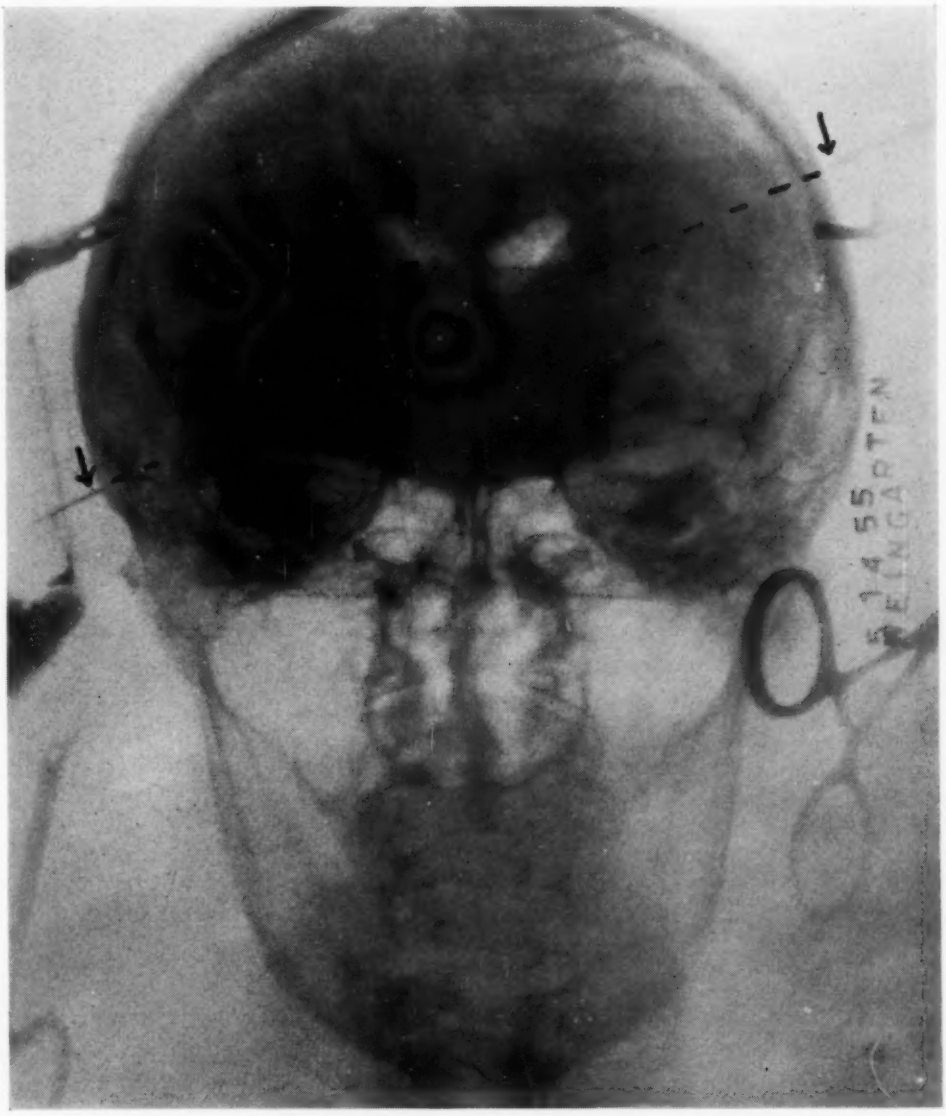

FIG. 10. Roentgenogram made after cannula has been placed in needle holder but not inserted into the brain. This demonstrates that the cannula indicated by the arrow is directed in the proper plane AB.

the patient demonstrates the development of any untoward neurologic or mental symptoms, the injection can be terminated. This, however, is rarely necessary.

Injection of approximately 0.75 cubic centimeter of absolute alcohol is usually sufficient for abolition of contralateral tremor and rigidity, but the amount of alcohol used varies from case to case, depending on the response in a given patient. When the injection has been completed, the pallidectomy guide is removed from the patient's head. The polyethylene cannula, however, remains in place so that its tip is at the site of the destructive lesion (Fig. 17). The wound is closed after the polyethylene cannula is firmly secured by a silk suture to the

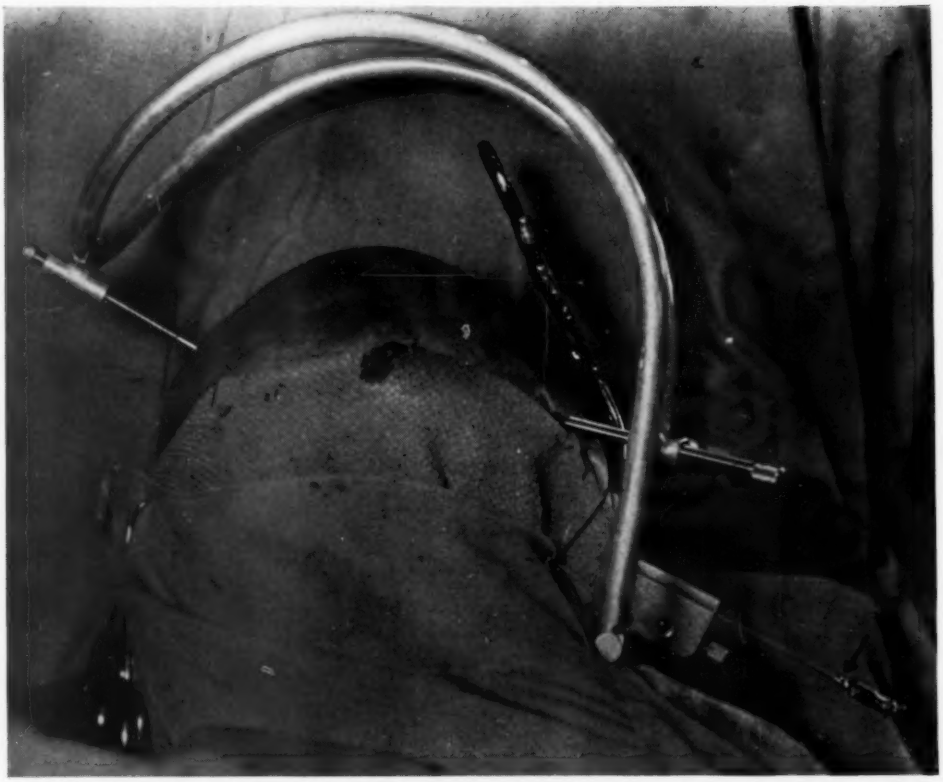

FIG. 11. Anterior view of the pallidectomy guide in place after polyethylene cannula has been inserted into the brain.

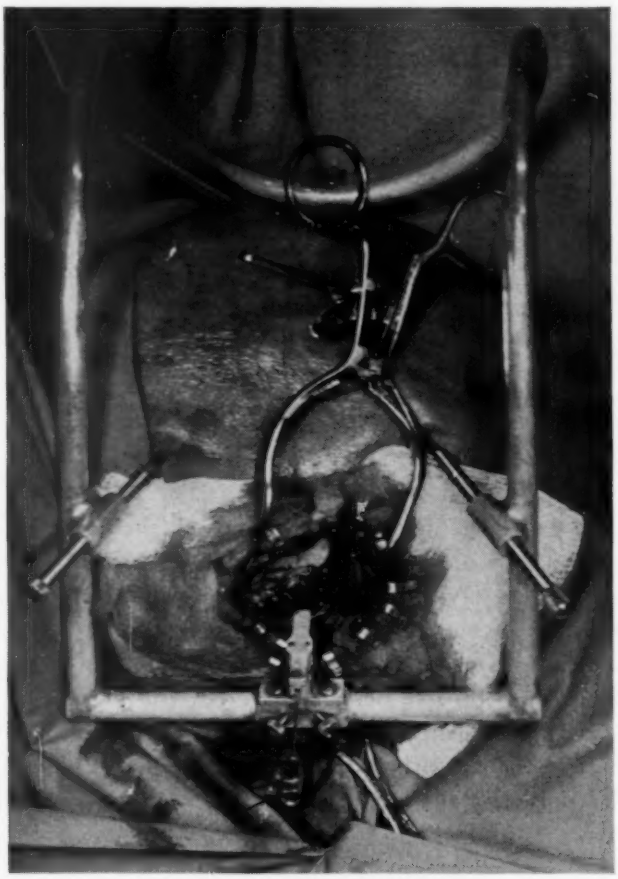

FIG. 12. Lateral view of pallidectomy guide after cannula has been introduced through the needle holder.

FIG. 13. Roentgenogram demonstrating intracerebral position of cannula when it has been advanced to the region of the globus pallidus. On the basis of current experience, this roentgenographic appearance of the position of the cannula would seem to represent the most ideal one for globus pallidus puncture.

dura. It is also secured during the closure of the muscle and skin. A polyethylene stylet with radiopaque marks at centimeter intervals replaces the firm stylet in the cannula.

Immediately following operation, a complete set of roentgenograms is made, to afford a permanent record of the position of the catheter.

In almost all cases, some degree of tremor and rigidity is seen to recur during the first postoperative week. Therefore, on the third postoperative day, a second

FIG. 14. Injection of procaine into the globus pallidus after the position of the cannula has been checked roentgenographically.

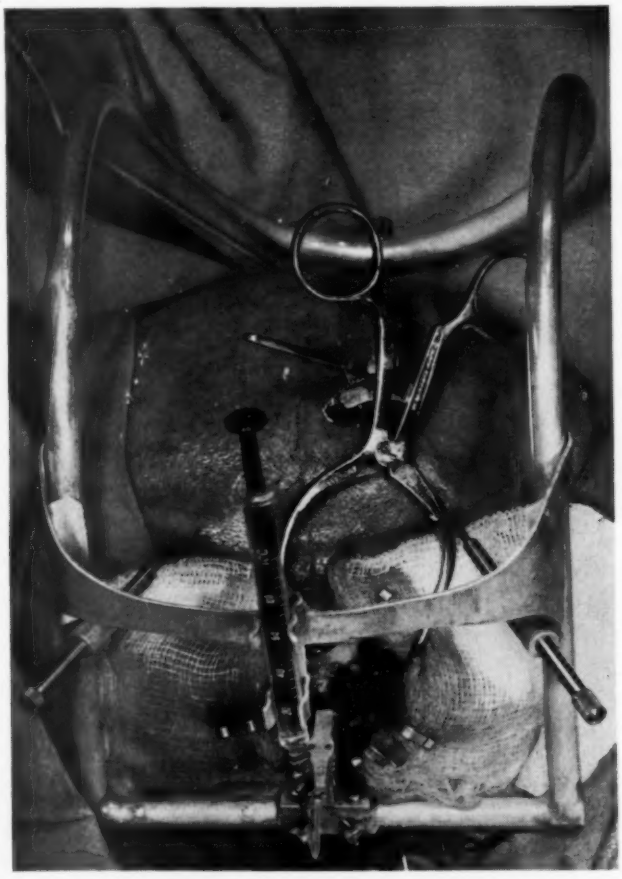

FIG. 15. Injection of absolute alcohol into the globus pallidus after procaine injection has demonstrated that the proper site has been reached. A tuberculin syringe containing 0.75 cubic centimeter of absolute alcohol is held in position by a syringe holder which can be attached to the pallidectomy guide. This facilitates the slow injection of absolute alcohol.

FIG. 16. The surgical drapings are arranged so that the patient can be examined throughout the operative procedure. This photograph shows the same patient pictured in Figure 4, immediately prior to operation. Note that, following absolute alcohol injection of the left globus pallidus, the right hand has assumed a normal position; and compare this with the parkinsonian attitude of the same hand in Figure 4.

injection of 0.75 cubic centimeter of absolute alcohol is carried out. Prior to reinjection, radiography is used to confirm the fact that the intracerebral cannula has remained in the desired position. *The cannula is allowed to remain in the brain for seven to fourteen days. This permits additional injections to be made in individual cases, depending upon the degree of alleviation which has been achieved in a particular patient.*

In our experience, lasting relief of tremor and rigidity can rarely be accomplished unless the cannula is permitted to remain in place in the brain, so that enlargement of the destructive intracerebral lesion can be accomplished during the early postoperative period.

There are many theoretic objections to the use of absolute alcohol as a destructive agent in the brain. It is possible that electrolysis, radioactive substances, ultrasonic vibrations or radio-frequency lesions may prove to be preferable. In our own experience, absolute alcohol has produced desirable and lasting results when properly employed. Therefore, its use is warranted until our own experience with other means of destruction of neural tissue, or the documented experience of others, prove some other agent to be superior. However, any neurolytic method can be utilized with this simple technique of globus pallidus puncture.

FIG. 17. Following completion of alcohol injection the pallidectomy guide is removed from the patient's head but the polyethylene cannula is allowed to remain intracerebrally. It is firmly secured by a silk suture to the dura. This permits repeated injection of alcohol during the postoperative period.

RESULTS

Seventy chemopallidectomies have been performed to date. Immediate good results, signifying abolition of contralateral tremor and rigidity, without motor weakness, have been observed in 80 per cent of the cases. In some instances, however, symptoms have recurred, so that to date, marked lasting alleviation of tremor and rigidity has been observed in 70 per cent of the patients in this series.

As noted previously in the case of anterior choroidal artery occlusion, one can be more certain of complete abolition of rigidity than of tremor. Nevertheless, tremor has been completely abolished in many of the cases in this series.

COMPLICATIONS

The mortality rate of chemopallidectomy is somewhat less than 3 per cent, there having been 2 postoperative deaths in 70 cases. There was 1 case of hemiplegia and 1 of slight residual hemiparesis. Following operation, several patients

demonstrated temporary, slight motor weakness lasting from one to three weeks. Ataxia and oculomotor nerve palsy developed in 1 case.

Among the elderly patients, periods of mental confusion were noted in several instances. These cleared up by the second postoperative week. Some patients demonstrated a peculiar negativism during the first two postoperative weeks. This too, was observed to clear spontaneously.

APPLICATION OF CHEMOPALLIDECTOMY IN ELDERLY PATIENTS

This operation may be used in elderly patients who have senile or arteriosclerotic parkinsonism, as well as in the younger subjects. It has been performed in patients as old as 75 years of age without incident. However, since the operation is carried out under local anesthesia and requires preoperative pneumoencephalography, the patient's state of health must be sufficient to withstand such procedures. Elderly subjects with evidence of marked senility, psychosis, or other signs of widespread nervous deterioration should not be considered as candidates.

Chemopallidectomy is a technique which is potentially capable of widespread usage in elderly individuals, as well as younger patients. It is a reasonably safe and accurate procedure. It has the advantage that the surgeon may withhold the completion of a permanent destructive brain lesion until the likely effects of operation have been estimated by intracerebral procaine injection. This ability to predict the probable result of operation in a given case adds both to the safety and to the possible success of the procedure. Moreover, slow injection of alcohol permits one to graduate the size of the lesion, depending upon response in a particular individual.

The use of globus pallidus puncture by the described technique, including the radiographic landmarks as well as the pallidectomy guide, is being investigated in other hyperkinetic disorders as well as in parkinsonism. Moreover, destructive lesions are being produced by electrolysis and by the radio-frequency lesion maker of Aronow, as well as by injection of absolute alcohol. Thus far, in our experience, the latter has produced the best results. However, comparative studies are continuing.

The following case reports are representative.

CASE REPORTS

Case 1. G. D.

A 61-year-old white male noted onset of tremor and rigidity of the right extremities seven years prior to admission to our service. Within one year after onset, tremor and rigidity were bilateral and involved all four extremities. The symptoms were progressive and very shortly thereafter the patient noted tremor of the perilabial musculature as well as weakness of speech and difficulty in swallowing. Emotional instability manifested by spontaneous crying inappropriate to the circumstances was noted for two years prior to admission.

On neurologic examination in June 1954, there were typical signs of moderately advanced parkinsonism, with masked facies. Speech was very weak and at times barely audible. There was considerable difficulty in swallowing both solids and liquids. Several times during the examination the patient had periods of spontaneous crying. There was a grade 2 tremor

of both upper extremities, which was typically pill-rolling in character. There was moderate rigidity of all four extremities. The posture was one of moderate flexion and the gait was festinating in type.

A right chemopallidectomy was performed July 2, 1954. This resulted in alleviation of tremor and rigidity of the left extremities. Moderate recurrence of the tremor was noted on the fourth postoperative day. At that time the site was reinjected with 1 cubic centimeter of absolute alcohol. This again resulted in complete abolition of tremor and rigidity of the left extremities. During the next twenty-four hours, slight weakness of the left extremities was noted. This gradually cleared within the ensuing two weeks. The patient was discharged, ambulatory, and with good motor power in the left extremities. He was entirely free of tremor and rigidity of these extremities four weeks following operation, and has remained so since that time. The masked facies, weakness of speech and bouts of spontaneous crying have been unaffected by the operation.

Remarks: Chemopallidectomy in this 61-year old man relieved tremor and rigidity of the left extremities and this relief has persisted up to the present time, fifteen months following operation. Gait and usefulness of the left extremities have also improved. Other stigmata of parkinsonism, however, have been unchanged by operation. Both the patient and his wife are satisfied with the results and have requested that a similar procedure be performed in order to alleviate tremor and rigidity of the right extremities. A decision in this regard has not yet been made.

Case 2. F. B.

A 68-year-old butcher was admitted to our service, bedridden, completely incapacitated, and expressing suicidal ideas. He had noted onset of tremor and rigidity of the left extremities six years prior to admission and these symptoms had spread to involve all four extremities one year after onset. Progression was rapid so that one year prior to admission, the patient had become completely incapacitated. Tremor of all extremities was violent. Rigidity was far advanced, so that the patient could not perform a single useful act. He required the constant attendance of a male nurse.

Neurologic examination in July 1954, revealed an elderly white man who appeared emaciated and greatly incapacitated. The principal findings were very marked tremor and rigidity of all four extremities. He could not turn over in bed, nor bring himself to a sitting position. When lifted out of bed, he could not stand unaided.

Right chemopallidectomy was performed July 10, 1954. This resulted in very marked alleviation of rigidity of the left extremities, with lessening but incomplete alleviation of tremor on that side. During the first twenty-four hours postoperatively, the patient became confused and removed the surgical headdressing. This necessitated removal of the indwelling intracerebral cannula before reinjection could be carried out. The mental confusion cleared rapidly and further convalescence was uneventful. He was discharged two weeks following operation.

This patient showed dramatic lessening of incapacitation postoperatively. Despite the fact that tremor was incompletely relieved, rigidity was virtually completely alleviated on the left side. Within two months after operation, he was able to dress himself, wash and feed himself and attend to his general daily needs. Since the third postoperative month, he has returned to work at his butcher shop although the duties he performs are of a limited nature.

Remarks: It is believed that the incomplete alleviation of tremor in this instance was partially due to the fact that reinjection was not carried out after the initial operation. Reinjection is now considered to be essential if one hopes to produce lasting relief of tremor with this technique. Nevertheless, the patient has had gratifying relief of rigidity and incapacitation and has been satisfied with the result.

Case 3. A. V. S.

In a 39-year-old white male tremor and rigidity of the right extremities developed eighteen years prior to admission. These symptoms became progressively more severe but

remained localized in the right extremities. Movements of the right arm and hand became increasingly difficult and the patient stated that for seven year prior to admission the right upper extremity had been completely useless. The patient presented a neurologic picture of hemiparkinsonism. Tremor of the right upper extremity was marked and there was moderate tremor of the right foot. Rigidity was marked in the right upper extremity and there was a peculiar dystonic tendency to maintain the arm in a flexed position on the chest. The patient often placed the right hand under the left axilla to try to control the tremor of this hand. He was unable to grasp a pencil or to use the hand in any way. All useful functions were performed with the left hand.

Left chemopallidectomy was performed February 15, 1955. This resulted in complete relief of tremor and rigidity of the right extremities. Reinjection was carried out on the sixth postoperative day, using 0.5 cubic centimeter of absolute alcohol. On the fourteenth postoperative day, a recurrence of tremor to about 30 per cent its preoperative level was noted. Reoperation was performed one month following the time of the original chemopallidectomy. The cannula was placed 1 full centimeter posterior to the position which it occupied at the original operation; 0.75 cubic centimeter of absolute alcohol was used with this procedure. Complete relief of tremor and rigidity was again obtained in the right extremities. Reinjection, using 0.75 cubic centimeter of absolute alcohol, was carried out on the fifth postoperative day and 0.5 cubic centimeter of absolute alcohol was injected on the eighth postoperative day.

There has been complete relief of tremor and rigidity of the right extremities since the second operation. Moreover, usefulness of the right extremities appears to be entirely normal. The patient is completely independent in all activities of daily living. The previous dystonic position of the right upper extremity during ambulation is no longer noted. He can write well with the right hand, feed himself using the right hand, and perform precision tool work and all other activities which he could carry out with the right upper extremity prior to the onset of tremor eighteen years previously.

Remarks: This case illustrates the virtue of persistence in selected cases. Although there was slight recurrence of tremor following the first operation, it was deemed worthwhile to perform a second operation in an attempt to achieve complete and permanent abolition of tremor and rigidity. The second attempt has been rewarding to the extent that this patient now appears to be virtually normal. This case illustrates the fact that it is possible to relieve long-standing tremor and rigidity completely by the simple technique of chemopallidectomy performed without any special instrumentation. The operation was performed prior to the development of the chemopallidectomy guide and the cannula was inserted through a trephine opening by hand. Alleviation of tremor and rigidity has been attended by a remarkable degree of recovery of function of the right extremities. The right upper extremity in particular, which had been useless for many years prior to operation, now appears to function normally in all respects.

Case 4. P. A.

A 67-year-old white male first noted stiffness of the left hand four years prior to admission. This prevented him from playing the clarinet, which was his means of earning a living. Rigidity spread to involve all four extremities, and difficulty in walking developed. Bradykinesia of all voluntary movements became prominent. One year prior to admission, the patient became depressed and had episodes of spontaneous crying.

Neurologic examination in May 1955, revealed a 67-year-old man who appeared younger than his stated age and who was in general good health except for the symptoms of parkinsonism. The principal signs observed were masked facies, rigidity of all four extremities, more marked on the left, bradykinesia of all movements and a stumbling gait.

Right chemopallidectomy was carried out July 1, 1955. The patient tolerated the operation exceedingly well. It resulted in virtually complete alleviation of rigidity of the left extremities. Tremor of the left extremities, which was only slight preoperatively, was also relieved. This patient made a complete recovery from operation. He was discharged from the hospital three weeks postoperatively.

Since the operation, the patient has been free of tremor and rigidity of the left extremities. There has been marked improvement in gait and the speed of voluntary motions of the left extremities has returned to the normal range. Fine movements of the fingers have returned and the patient has been able to resume playing the clarinet, although he has not returned to work.

Remarks: This patient demonstrates the possible usefulness of the operation in elderly persons. He is considered to represent the ideal candidate for operation among patients in the seventh decade of life. He fulfilled certain criteria which are considered favorable in selecting elderly patients for operation, as follows: 1) He appeared physiologically to be younger than his chronologic age. 2) His incapacitation was principally due to rigidity. 3) There were no unfavorable psychologic manifestations preoperatively nor any evidence of senile deterioration.

Case 5. F. H.

A 60-year-old former college professor noted onset of rigidity of the right extremities sixteen years prior to admission. This rigidity progressed, to cause increasing disability in the use of these extremities. Three years after onset, the left side also became involved. Painful muscular cramps developed in the right extremities; these often awakened him from sleep at night and were a source of great discomfort. Walking became difficult and he often fell. During the five years prior to admission, generalized slowness of all movements became marked. For three years prior to admission the patient was disabled and required nursing care and assistance in all activities.

Neurologic examination in May 1955 revealed the typical signs of senile parkinsonism. The patient appeared older than his stated age of 60. In both upper extremities there was moderate tremor (more marked on the right side) and generalized rigidity with cogwheelism. Rigidity was also more marked in the right extremities. In the standing position, the patient demonstrated marked flexion of the trunk and neck. All movements were slow. There were no associated movements of the extremities during walking. Propulsion was marked and the patient could not walk more than ten to fifteen steps without falling. The face was mask-like and the voice was inaudible.

Left chemopallidectomy was performed on May 28, 1955. There was immediate complete relief of tremor and rigidity of the right extremities. At the time of operation, 0.75 cubic centimeter of absolute alcohol was injected; an additional injection of 0.5 cubic centimeter was made on the third postoperative day.

The patient was mentally confused for two weeks following operation, but the postoperative course was otherwise uneventful. He was discharged one month postoperatively.

Although the follow-up period in this case is short, the patient has remained free of tremor and rigidity of the right extremities since the time of surgery. He walks well and has lost his flexion attitude and tendency towards propulsion.

A letter from the patient's wife three months after operation stated the following: "My husband's progress is quite marked so far. He has lost the fear of falling and has no appearance of propulsion. He walks upright and does not shuffle. His body is now straight. He shaves himself and dresses himself completely and does these things quickly. He is now able to use a fork while eating, where he had to use a spoon prior to operation. He negotiates stairs easily and is able to go out of the house by himself. Whereas he watched television all day long previously, because of his inability to move, he now looks at television for a short period at night (during the commercials, he gets up and walks around for exercises!). His voice is stronger and I can understand him better than I could; however, he still has some difficulty in his speech. He is perfectly clear in his mind but he has some trouble remembering names. All in all, we think he is a wonder."

Remarks: This patient, although only 60 years of age, would not have been accepted as a candidate for anterior choroidal artery occlusion. Nevertheless, his incapacitation because of rigidity made him an excellent candidate for chemopallidectomy and his postoperative course has, thus far, been rewarding.

The cases which have been cited were selected from among the earliest patients as well

as from among the most recent in the series. They serve to illustrate the utility of chemopallidectomy in selected cases among elderly individuals. Much will depend upon the results of continued follow-up studies and wider experience. However, the relative safety of the procedure and the results obtained thus far, as illustrated by the foregoing case reports, warrant the judicious use of chemopallidectomy in the elderly as well as in the young patient with parkinsonism.

SUMMARY AND CONCLUSIONS

Useful alleviation of many of the symptoms of parkinsonism may be obtained by neurosurgical intervention in selected cases. Therefore, the advisability of employing neurosurgery should be considered in any patient who has reached a moderately advanced stage of the disease. In considering surgery for a particular patient one should evaluate the degree of disability, duration of the illness, response to medication, prognosis of the disease and the life situation. Moreover, the various surgical approaches should be evaluated and the advantages and disadvantages in relation to the particular patient should be considered.

Since far advanced incapacitating signs and symptoms of parkinsonism can be relieved in some cases, one can conclude that parkinsonism is not necessarily a hopeless, irreversible disease. Both tremor and rigidity may be relieved without necessarily sacrificing motor power. In many instances the alleviation of tremor and rigidity are attended by marked lessening of the other stigmata of parkinsonism and by increased ability of the patient to provide for his own needs.

The operation of chemopallidectomy, if performed meticulously in cases which have been properly selected, can produce good results in 70 per cent of parkinsonian patients, including those in the senile or arteriosclerotic age group.

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PREVENTION OF EMOTIONAL DISORDERS IN LATER LIFE

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The prevention of emotional disturbances in old age is an important but often neglected aspect of geriatric preventive medicine. When depressions and such disorders develop, it is obvious that the emotional state influences the general health, but there is a tendency to disregard this fact in our everyday care of elderly patients.

Happiness and health are closely related. As physicians, we have the obligation not only to cure physical disease, but also to help our patients achieve enough happiness and feeling of well-being to keep them productive and free from complaints. This is particularly true in the case of our older patients. Too many elderly people are neither sick nor well, but grumble and complain endlessly because of their inability to achieve happiness without help. Their complaints often are of a physical nature but have an emotional cause. The wise physician soon learns to see through the symptoms of headache, dyspepsia, aching back, sleeplessness, and all the assorted complaints that bring people to the physician, so as to discern the underlying dissatisfaction with life that the symptoms express. Such patients need help, but the help should be directed toward the basic dissatisfactions, rather than toward the resulting symptoms. The cause of most headaches is in the environment, rather than in the head. More dyspepsia is caused by inability to stomach some unacceptable situation in life than by actual stomach disease. Each symptom must be considered for its possible hidden meanings. The happy person, interested in the world about him, seldom complains.

The later years of life are a miserable time for many people because of the difficult adaptations required. All successful living is a matter of adequate adaptation to the world about us, and the elderly may find themselves faced with the necessity of adaptations beyond their adaptive capacity. The loss of one's mate or one's children, changes in living conditions or in state of health, retirement with its resulting diminished income and lack of occupation, all may strain a person's adaptive capacity to the point where psychosomatic complaints develop. The symptoms then produce dread of disease and incapacitation, and these fears produce further anxiety and further symptoms, so that there is a vicious circle of worry and incapacitation. People vary in their particular life-situations, in their reactions to them, and in the symptoms with which they express these reactions, but the process of reacting to difficult situations in a particular way repeats itself endlessly in any individual patient.

Much difficulty in later life is due to the fact that many people spend their lives aging rather than maturing. All children start life with a self-centered attitude, but emotional maturity brings a more realistic concept of self in relation

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to the rest of the universe. When egocentricity persists throughout adult life, unhappiness is the result, as the world never gives the self-centered person what he considers his due share of appreciation. This discrepancy between the way one regards oneself and the way the world regards one is more difficult to accept as a person grows older, for our modern world has ceased to regard the elderly with much respect. Seeing others take one's place, and being made to feel progressively more useless, is hard to accept. Feelings of resentment arise, such feelings are repressed, and the result is the development of psychosomatic symptoms as an indirect way of expressing the emotions that cannot be expressed directly.

A recent study (1) showed 88 per cent of nonpsychotic emotionally disturbed people past the age of 60 to be depressed as the result of various unfavorable circumstances in their lives to which they were unable to adapt successfully. Among these factors of which they complained were dissatisfaction with present living arrangements, failing physical strength, loneliness, worry, excessive responsibility, and the death or illness of loved ones. Many were people who had never really learned to enjoy their assets and to disregard or to overcome their liabilities, so that life had been less of a happy adventure than a grudgingly endured ordeal. As advancing years brought diminished ability to accept the changes that life brings, their adaptive capacity fell so far short of the demands on it that symptoms of emotional illness appeared, severe enough to necessitate psychiatric treatment.

Some situations are hard for anyone to accept, but most situations are made difficult only by the outlook of the persons involved. A person with an inelastic way of meeting life, or a criticizing, complaining attitude that always expects more consideration than is warranted, is likely to find any situation difficult. This is well illustrated in the contrast between the attitudes of the 2 following patients.

Case 1

H. H., a 61-year-old widow, who sought medical help because of headaches, complained: "I feel hopeless and irritable. I feel that everybody is out of step with me. I don't like the younger generation, I don't approve of modern methods, the modern world irritates me. Religion is supposed to keep people happy, and I have always gone to church and tried to live right, but still I feel dissatisfied. I devoted my life to my children, but now they find me disagreeable because I argue with them and try to show them their mistakes in life. I can't keep from overeating, and I haven't the energy to do anything. I have a comfortable place to live but I can't enjoy it. I resent people when they come to see me, and feel lonely and neglected if they don't. I'm not really interested in anything."

This woman, expressing a disgruntled attitude seen all too often in the elderly, will probably always have a tendency to express her resentments by psychosomatic symptoms as well as by verbal complaints. Obviously her life is a "headache" to her, and the symptom of headache is a dramatic way of expressing her feelings toward the world about her. She was helped to understand this, as a result of psychotherapy, and her headaches disappeared as she achieved a more constructive outlook on life.

Case 2

P. M., a 77-year-old widow, when asked why she felt so happy in spite of her age, replied: "I am reasonably healthy, and I have enough income to live on. My children are

away, but they don't worry me, as they seem to be managing their own lives to their own satisfaction. Their being away leaves me free to do the things I like. People interest me; I like them; I like to see how they handle the problems in their lives. By knowing people and seeing them, I am never bored. I like other things too, such as books and animals and the outdoors, and I have time to enjoy these now. I have faith in something bigger and more powerful than I am, and I believe that life is planned and guided day by day by a master-mind without which life would be lonely and ineffectual. The present tumultuous conditions of the world are thrilling, history is being made so fast that I am in a hurry to wake up each morning to hear what has happened since yesterday. There's not a dull moment; there's always something of interest around the corner, whether I live to see it or not. How can anyone think life dull?"

This woman, with her active interests and her ability to enjoy even the small details of the life about her, will probably never become emotionally ill, as she has succeeded in adapting well to the changes brought into her life by advancing age.

The first step in preventing unhappiness in later life is to realize the fact that we all must experience age, and we must learn to appreciate its assets rather than bemoan its liabilities. Learning to be a spectator rather than a competitor is never easy for some, and exchanging the strenuous activity of youth for the quieter satisfactions of advancing years is even harder, but both are a necessary requirement for happiness in later years. We must encourage our patients of all ages to cultivate hobbies and habits of observant study that will lead to interests that can be continued into later life. Active interests that are possible of fulfillment leave little time for the self-pity, morbid fears, or dissatisfactions that idleness brings. Occupation of some sort is essential to everyone, and many vocational and recreational occupations are possible for the elderly, if efforts are made to make them available. Recreational centers fill a great need in many communities, by supplying friends, companionship, interests and useful activity. Among the greatest necessities for a happy and successful old age is the development of a positive philosophy of life, or religious faith. With the broader vision of life that a positive faith brings, personal dissatisfactions diminish, and the whole picture can be seen instead of just one's own small viewpoint. Even the approach of death can be regarded without fear, if it is regarded as just the introduction to the next chapter of a biography that has already had many chapters. With interests, occupation, and faith, and an elasticity of outlook that enables one to adapt to changing conditions, there is little likelihood of emotional disorders developing, even in the aged.

SUMMARY

The importance of preventing emotional illness in later life is stressed as a vital part of any program of geriatric preventive medicine. The avoidance of a self-centered, self-pitying, inelastic attitude, the cultivation of a realistic religious faith, and interests and activities suitable for the age and the person, do much to increase the adaptive capacity so necessary in meeting the demands of later life.

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THE SENSITIZATION RESPONSE (SR) IN CANCER OF THE UTERINE CERVIX*

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The sensitization response (SR) is a phenomenon observed in the vaginal smear, and is of prognostic significance. Not only does it aid in the selection of treatment, but it may indicate the incidence of regional metastases as well.

Some patients with cancer of the cervix show changes in the nonmalignant cells of the vaginal smear before any treatment has been given. The cytoplasm is increased in density, finely vacuolated, and stains a dark lavender with Papanicolaou's stain. This characteristic change is found in the basal cells (transitional cells in histologic terminology) and is called the sensitization response, or SR (1). Its frequency is determined by differentially counting 100 consecutive nonmalignant epithelial cells. The number showing SR is expressed as a percentage, and the cases are arbitrarily divided into two groups: 1) those with 10 per cent or more SR, called marked SR, and 2) those with 9 per cent or less, called poor SR. About 30 per cent of all patients with cervical cancer show marked SR. When divided according to stage, it is found that Stage I cases have 22 per cent marked SR; Stage II, 37 per cent; Stage III, 32 per cent; and Stage IV, 18 per cent marked SR. SR is virtually never seen in patients with only carcinoma in situ (Stage 0). It is most frequent in Stage II.

The term "sensitization response" was applied because it seemed that the tumors of patients in whom the response was marked were especially sensitive to radiation and reacted well to it. In a series of 136 patients treated radiologically and observed for five years, the following results were obtained:

Stage I.	Marked SR—7 of 12 cured.	Poor SR—6 of 23 cured.
Stage II.	Marked SR—24 of 30 cured.	Poor SR—8 of 35 cured.
Stage III.	Marked SR—6 of 8 cured.	Poor SR—1 or 20 cured.
Stage IV.	Marked SR—0 of 1 cured.	Poor SR—0 of 7 cured.

Of the entire group of 136 patients, 51 had good SR and 37 (73 per cent) were cured, whereas 85 had poor SR and only 15 (18 per cent) were cured. Thus it is evident that SR is at least as significant as clinical staging in estimating the outcome.

Ever since the establishment of radiotherapy forty years ago as a standard method of treatment in cancer of the cervix, the physician has been puzzled by the selection of treatment, for in the operable group of cases (Stages I and II) neither surgery nor radiation has cured all cases. Would the case uncured by

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TABLE 1

Sensitization Response Related to Cure Rates in Cancer of the Cervix

Stages I and II

SR	Radiotherapy*		Radical hysterectomy & regional lymphadenectomy†	
	No.	Cure	No.	Cure
9% or less	58	14 (24%)	80	57 (71%)
10% or more	42	31 (74%)	23	9 (39%)

* 5-year results.

† 2–5 year results.

surgery have been cured by radiation, or vice versa, or would defeat have followed either method? Some pessimistic fatalists have maintained that cancer, if refractory to one method, is equally refractory to the other. Others, less confident and more optimistic, have felt that cure could follow one form of treatment but not the other, if one only knew how to select the therapy. Interestingly enough, SR offers some help in this regard, for the cases treated surgically seem to respond differently from those irradiated, as may be seen in Table 1. Patients with cancer of the cervix in Stages I and II, when treated surgically, show a 71 per cent cure rate (57 of 80) in the presence of poor SR, and only a 39 per cent cure rate (9 of 23) in the presence of marked SR. These results are to be contrasted with those in patients treated radiologically, in whom there is a 24 per cent (14 of 58) cure rate associated with poor SR, and a 74 per cent (31 of 42) cure rate associated with marked SR. Obviously one would prefer to treat those with poor SR surgically, and those with marked SR radiologically, and thus perhaps achieve a substantial improvement in the net result.

SR seems to be a specific phenomenon and, at the same time, it correlates with other well recognized cytologic findings. Because SR is found almost exclusively in the basal cells, it is possible that basal cells themselves may be of prognostic significance. Basal cells originate deep in the epithelium and are readily differentiated from the more superficial precornified and cornified cells that make up the remainder of the normal squamous epithelial flora of the vaginal smear. Actually, the same trend as that in SR is seen, if patients are divided according to the proportion of basal cells present—9 per cent or less, and 10 per cent or more (Table 2). Patients with lesions in Stages I and II, if treated radiologically, have a 55 per cent (31 of 56) cure rate in the presence of many basal cells, and a 32 per cent (14 of 44) cure rate when the basal cells are few. Those treated surgically have a 50 per cent (13 of 26) cure rate in the presence of many basal cells and a 69 per cent (57 of 77) cure rate when there is a paucity of basal cells. These figures lack the precision of SR data, but nonetheless show the same general pattern. Postmenopausal patients tend to have more atrophic epithelium and thus more frequent basal cells in the smear. However, age or relation to the menopause does not explain either basal cells or SR in their prognostic role.

One of the major factors in the curability of cancer is metastasis. If the tumor

TABLE 2

Basal Cells Related to Cure Rate in Cancer of the Cervix

Stages I and II

Basal cells	Radiotherapy*		Radical hysterectomy & regional lymphadenectomy†	
	No.	Cure	No.	Cure
9% or less	44	14 (32%)	77	53 (69%)
10% or more	56	31 (55%)	26	13 (50%)

* 5-year results.

† 2–5 year results.

TABLE 3

Sensitization Response Related to Cure Rates and Metastasis in Cancer of the Cervix

Stages I and II

SR	Radiotherapy		Surgery		Regional metastases	
	No.	Cure	No.	Cure	No.	+ Nodes
9% or less	58	14 (24%)	80	57 (71%)	104	18 (17%)
10% or more	42	31 (74%)	23	9 (39%)	33	21 (64%)

has spread to the regional lymph nodes, the cure rate drops precipitously in surgically-treated cases, and radiotherapy is popularly regarded as being even less effective. However, the evaluation of radiotherapy here is difficult, for there is no satisfactory method of determining when the lymph nodes are involved. Cases classified clinically as Stage I are actually found to have a 17 per cent incidence of regional metastases, and Stage II cases a 31 per cent incidence when lymphadenectomy is performed, so clinical appraisal is of little value for this purpose. There is little direct evidence, aside from the well known failure of radiotherapy in the treatment of inoperable regional metastases. It is widely acknowledged that a mass of tumor that cannot be removed surgically is no more amenable to cure by irradiation. However, it does not necessarily follow that operable nodes are equally insensitive.

In Table 3 are indicated the incidences of regional metastases in 137 cases of Stages I and II cancer of the cervix treated with radical hysterectomy and regional lymphadenectomy, divided according to SR. As may be seen, patients with poor SR had only 17 per cent positive nodes, whereas those with marked SR had a 64 per cent incidence of positive nodes. This fits rather well with the surgical results, for the findings in a large collected series (1,396 cases) treated with the Wertheim-type operation showed a 62 per cent cure rate in those with negative nodes and a 21 per cent cure rate in those with positive nodes (2). Patients with poor SR have a low incidence of regional metastases and a high cure rate when treated surgically. Those with marked SR have a high incidence of nodes and a low cure rate when treated surgically. However, the cure rate in those with marked SR after radiotherapy is high (74 per cent). This apparent

paradox leads to the conclusion that some patients with regional metastases can be "cured" by irradiation.

The essential nature of SR is unknown. We have some fragmentary evidence that it is an immune response on the part of the host toward the tumor. There can be little doubt that, when it is present, the tumor is much more likely to respond to irradiation and the patient to be cured than when SR is weak or absent. In the same vein, those patients with "early" cancer (lesions confined to the cervix or its immediate environs) who have poor SR are apparently best treated with surgery. It may be that in this group the tumor has not yet extended very far or reached a sufficient size to elicit the sensitization response. However, one must bear in mind that this type of case is quite different from the more advanced case with no SR. In the latter, SR may have once developed, thus partially holding the tumor in check, only to disappear as defenses faltered under the relentless advance of cancer. In such a woman, with a virulent tumor and poor SR, the tumor is unlikely to respond to irradiation, but neither is the patient a suitable candidate for radical surgery. The phenomenon of SR may be of some value in selection of treatment and in estimating the frequency of lymph node involvement in the "early" case, but the same interpretation cannot be applied in the more advanced lesions.

SUMMARY

The sensitization response (SR) is observed in the nonmalignant epithelial cells of the vaginal smear. It is of value in the prognosis of patients treated radiologically. In patients with cancer of the cervix in Stages I and II, those with poor SR have a low incidence of regional metastases and a high rate of surgical cure. Those with marked SR have a high incidence of lymph-node metastases and are best treated radiologically.

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RETRORECTAL HEMANGIOENDOTHELIOMA*

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INTRODUCTION

Due to the low incidence of retrorectal tumors, particularly retrorectal hemangioendothelioma, a physician may never encounter one in a lifetime of private practice. The case presented here stimulated my interest in vascular and retrorectal tumors, and it is hoped that the report will be of value to other observers.

ANATOMY OF RETRORECTAL SPACE

The retrorectal or presacrococcygeal space (1) is normally only a potential one and is present when the rectum is displaced anteriorly. It is bounded anteriorly by the rectum, posteriorly by the sacrum and coccyx, superiorly by the reflection of peritoneum on the rectum at approximately the junction of the second and third sacral segments, inferiorly by the floor of the perineum, and laterally by the walls of the pelvis. The space contains branches of the sacral and sympathetic plexus of nerves; the middle sacral, iliolumbar and middle hemorrhoidal blood vessels; and lymphatics.

SYMPTOMATOLOGY OF RETRORECTAL TUMOR

The symptoms presented by a retrorectal tumor vary, depending on the size and origin of the tumor, location in the pelvic cavity, degree of bone erosion, and degree of involvement of the sacral nerves. The following may be present: low back pain, unilateral or bilateral radiating leg pain with paresthesias and weakness, rectal pain, constipation, urinary incontinence, and difficulty in voiding.

INCIDENCE

The incidence of retrorectal tumor is low. According to Ewing it occurs only once in 34,582 tumors of the newborn, and according to the Mayo Clinic statistics for a period from 1922 to 1936, only once in 40,000 admissions (2). Hemangioendothelioma is a rare tumor, which may be found anywhere in the body. Only 8 cases were collected in twenty-two years at the Bellevue Hospital (3). At the Eastern Maine General Hospital, from 1947 to 1953, among 32,860 surgical specimens, the present case of retrorectal tumor was the only one reported. However, 9 hemangioendotheliomas and 2 hemangiopericytomas were present in this group of 32,860 cases. These tumors were located as follows:

Hemangioendotheliomas

Nose	1
Neck	1

* Presented at a meeting of the medical officers of the First Marine Division in Korea, May 5, 1954. Published in abbreviated form in *U. S. Armed Forces Medical Journal* **5**: 1501–1508 (Oct.) 1954.

Back (skin)	2
Middle ear	1
Thigh, subcut. tissue	1
Leg, skin	1
Retroperitoneal tissue of pelvis (retrorectal)	1
Face (skin)	1

Hemangiopericytomas

Uterus	2

Wise (4), and Bacon and associates (5) each reported a single case of a retroperitoneal pelvic hemangiopericytoma. Jackman and associates reported 2 cases of retroperitoneal pelvic hemangioendothelioma, in patients 3 and 15 years of age, respectively.

CLASSIFICATION

After the presence of a retrorectal tumor has been determined by rectal digital examination, the types of lesions occurring in this region must be considered in attempting to make a diagnosis (1, 2, 6, 7):

I. *Congenital*
- (a) Renal—ectopic kidneys (pelvic)
- (b) Meningocele
- (c) Teratoma group
  1. Benign
  2. Malignant
- (d) Chordoma

II. *Inflammatory*
- (a) Chronic infections from rectal fistulas.

III. *Neurogenic*
- (a) Neurofibroma
- (b) Ependymoma
- (c) Neurilemmoma
- (d) Ganglioneuroma
- (e) Ependymal-cell glioma

IV. *Osseous*
- (a) Osteogenic sarcoma
- (b) Chondroma and osteochondroma
- (c) Ewing's tumor
- (d) Giant-cell tumor

V. *Vascular and lymphatic*
- (a) Hemangioendothelioma
- (b) Hemangiopericytoma
- (c) Hodgkin's granuloma
- (d) Lymphosarcoma
- (e) Lymphangioma

VI. *Soft tissue*
- (a) Lipoma
- (b) Myoma
- (c) Fibroma
- (d) Fibrosarcoma
- (e) Rhabdomyosarcoma

VII. *Metastatic*

DIAGNOSIS

As previously stated, the presence of a retrorectal tumor is determined by rectal digital examination. An impression may be obtained as to the type of tumor by its consistency, attachments, relative location in the pelvis, and the results of the following diagnostic studies:

1. Pelvic examination—for the presence of associated genital pathologic conditions.
2. Proctoscopic and sigmoidoscopic examinations—to rule out inflammatory lesions and rectal tumors.
3. X-ray films of the pelvis—to determine if bone erosion or primary bone tumor is present.
4. Retrograde pyelogram—to determine the position of the kidneys, and whether or not there is displacement of the ureters.
5. Barium enema—to determine the condition of the colon and the amount of displacement of the rectosigmoid, thus giving some indication of the size of the tumor.

The importance of this roentgenologic examination is illustrated by the case of a 45-year-old woman with a presacral mass, who was informed by a physician five years previously that the tumor was a lipoma. This diagnosis was based on a biopsy made at the time of a routine appendectomy. An intravenous pyelogram failed to visualize the kidneys or ureters. A retrograde pyelogram revealed the presence of ectopic kidneys in the pelvis. Fortunately the biopsy specimen included only the perinephric fat.

After completion of all the diagnostic studies and consultations with the roentgenologist, urologist, neurosurgeon and orthopedic surgeon, in such cases it may still be impossible to say definitely whether or not the lesion is a congenital anomaly (with exception of ectopic pelvic kidneys and teratomas in which teeth or bones are visible by x-ray), or a vascular, or a soft-tissue tumor. Definitive diagnosis in these groups of tumors must await surgery, and usually rests with the pathologist.

TREATMENT

The patient can be cured only by complete surgical removal of the tumor. Radiation treatment (8, 9, 10) may afford palliation in some types of retrorectal tumors, but should be reserved for those cases in which, either because of the physical condition of the patient or the extensive growth of the lesion, complete surgical removal is impossible. Operation may be performed by 1) the posterior

approach through a longitudinal parasacral incision with removal of the coccyx, 2) the intra-abdominal approach, or 3) a combination of both methods—depending on the size of the tumor and the degree of involvement of the ureters.

MALIGNANT VASCULAR RETRORECTAL TUMORS

As the retrorectal tumor in this case report was a hemangioendothelioma, further discussion of this group of lesions is warranted. In order to understand the development of vascular tumors, one must consider the embryology of the blood vessels. The endothelial cells originating in the vascular layer of the mesenchyme form solid cords and islands. Lumens appear in the cords of cells and they unite to form continuous tubes. The hemangioma originates from the independently growing endothelial cords that have not joined with the other developing network of blood vessels. The reason for this abnormal development and growth of cells is not known. Andervont (11) produced sarcomas, hemangiomas, and hemangioendotheliomas in mice by the administration of o-amino-azotoluene.

Benign vascular tumors are common, but malignant tumors are rare. It is possible to have the following malignant vascular tumors:

1. Leiomyosarcoma (none reported).
2. Hemangiopericytoma (consisting of the pericytes).
3. Hemangioendothelioma.

Stout (12–17) has been foremost in reporting cases and differentiating hemangioendothelioma from hemangiopericytoma pathologically. The term hemangiopericytoma was devised by Stout and Murray. The cell characterizing the tumor is a highy specialized contractile cell which clings to the outer surface of the capillaries. It was given the name pericyte by the Swiss histologist, Zimmermann, who believed the pericyte was a modified smooth-muscle cell. The hemangiopericytoma consists of many capillaries lined by normal endothelial cells separated by a fibrous sheath; outside the fibrous sheath are the pericytes. This differentiates the tumor from the hemangioendothelioma in which the endothelial cells play the dominant role and are heaped up inside the fibrous sheath. In distinguishing one malignant tumor from the other, it is necessary to use silver reticulin stain in order to identify the fibrous sheath clearly.

The term hemangioendothelioma was first used by Mallory in 1908 to describe a malignant vascular tumor in which the endothelial cell accounts for the aggressive growth and metastatic properties of the lesion. Hemangioendothelioma is more frequently found than the hemangiopericytoma, but it is still a rare neoplasm. It is usually malignant but benign examples are known. Most of the benign forms appear at an early age, or are congenital. The endothelial cells form many layers around the lumen of the capillaries. The malignant forms are characterized by unrestrained proliferation of atypical endothelial cells and anastomoses of the tumor vessels. Hemangioendothelioma may occur in any organ or tissue of the body, but is most commonly found in the skin, subcutaneous tissue, and bone. It may manifest itself at any age, but half the cases occur in childhood or youth. Growth of the neoplasm may be slow or rapid and is infiltrative in character. Metastasis is common and is usually by way of the blood stream, but occasionally

by the lymphatic route. The tumor is found with about equal frequency in both sexes. Stout questions the existence of a benign metastasizing hemangioma.

When metastasis occurs, the tumor can be identified as a hemangioendothelioma if sufficient tissue be examined. Pulford (18) reported a case of benign hemangioma of the breast, which later became locally malignant hemangioendothelioma and eventually metastasized. If the interpretations of pathologic findings be correct, apparently it is possible for a hemangioma to change to a malignant hemangioendothelioma.

CASE REPORT

The patient, an 81-year-old man, first consulted a physician because of dysuria of two days' duration. He had had nocturia (two voidings) for several years but denied frequency during waking hours. Increasing constipation had been present for two years, necessitating a laxative every night. One year previously the patient had right sciatic neuritis, lasting for three months and followed by weakness of the right leg. There was no weight loss. The family history showed a high incidence of malignancy; a brother had had carcinoma of the sigmoid and died at 75 years of age, and a sister had had carcinoma of the breast and died at 69 years of age. His other sister, 78 years old, was living and well.

Physical examination revealed a well preserved man who appeared no older than 60 years of age and who was apparently in good health. The head, eyes, ears, nose and throat were essentially normal. His weight was 165 pounds. His heart was not enlarged on percussion, and the rhythm was regular; there was a systolic grade I murmur at the apex. Blood pressure was 160/80. The lungs were normal. The patient had a left direct inguinal hernia supported by a truss, and an umbilical hernia (two-finger sized opening). The liver and spleen were not palpable, and no masses could be palpated in the abdomen. The genitalia were normal. On rectal digital examination the prostate was hard, twice normal size, and regular. At the end of the examining finger, posterior to the rectum, a grapefruit-sized mass could be felt which seemed to be outside the rectal wall. The mass was hard and not movable. The right knee jerk and ankle jerk were slightly diminished compared with the left. There was slightly decreased muscular strength of the right leg as compared with the left but no muscular atrophy was apparent.

Results of laboratory studies, including a complete blood count, erythrocyte sedimentation rate, Kahn, Hinton and acid-phosphatase tests, urine and stool examination, and an electrocardiogram were essentially within normal limits.

Proctoscopy and sigmoidoscopy showed the rectum to be pushed anteriorly and to the left by a hard mass which was located outside of the rectum and which did not penetrate the rectal mucosa. The sigmoidoscope was passed its entire length and no other abnormalities were visible.

A roentgenogram showed the chest to be normal; no enlargement of the heart or aortic abnormality was apparent. A barium enema revealed diverticulosis of the descending colon and sigmoid. A large mass visible in the pelvis displaced the rectum anteriorly and cephalad for a considerable distance. The bones of the pelvis appeared to be normal (Fig. 1). An intravenous pyelogram was unsatisfactory, but a retrograde pyelogram provided adequate visualization of the kidneys and ureters and showed no evidence of ureteral obstruction; however, the right ureter was displaced to the left in its distal third (Fig. 2).

The preoperative diagnosis was retrorectal tumor, probably malignant, possibly a sarcoma. The abdominal route was chosen because of the size of the tumor and the apparent attachment to the right ureter. A midline suprapubic incision extending from the pubis to a point above the umbilicus was made. The umbilicus was removed, and the umbilical hernia was repaired when closing the abdomen. The rectum, sigmoid, and bladder were found to be pushed anteriorly and cephalad by a grapefruit-sized mass located in the floor of the pelvis, posterior to the rectum. The lateral peritoneal attachment of the sigmoid was incised and carried downward and across the rectum below the brim of the

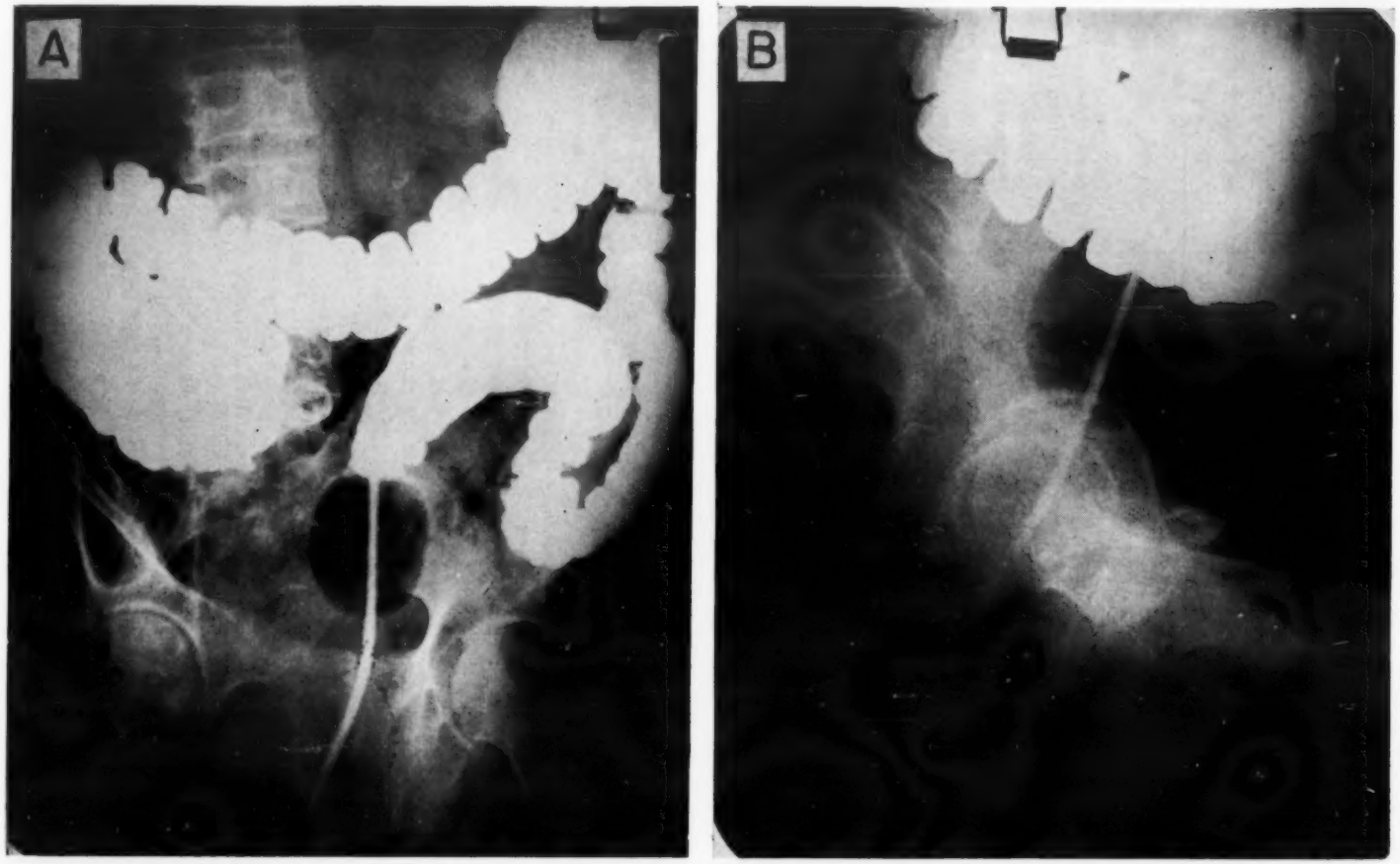

FIG. 1. Barium enema studies showing displacement of the rectum. (**A**) Anteroposterior view, and (**B**) lateral view. Balloon is normally located in area of dotted lines. (Reproduced from Whitney, B. V.: An unusual retrorectal tumor, *U. S. Armed Forces M. J.* **5:** 1501–1508 (Oct.) 1954.)

FIG. 2. Anteroposterior view of retrograde pyelogram showing displacement of right ureter. (Reproduced from Whitney, B. V.: An unusual retrorectal tumor, *U. S. Armed Forces M. J.* **5:** 1501–1508 (Oct.) 1954.)

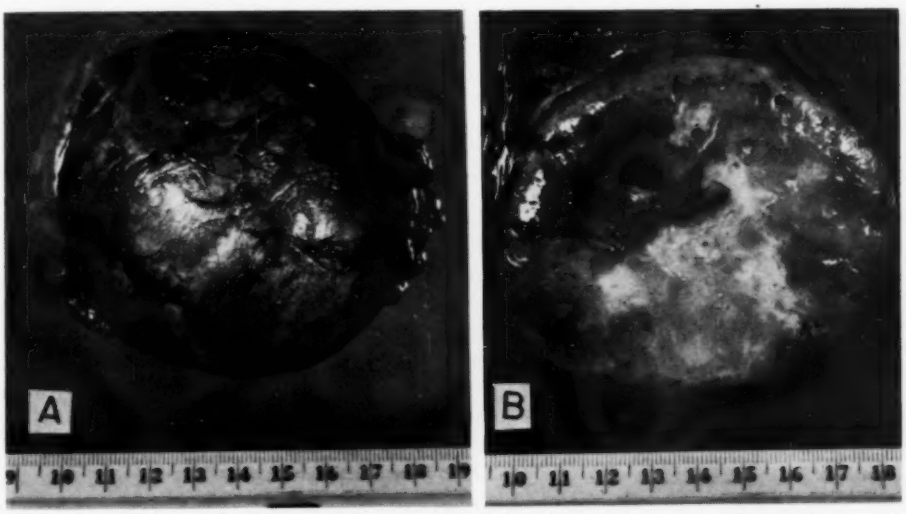

FIG. 3. (**A**) Tumor showing the broader pedicle of attachment to the rectum and the smaller pedicle of attachment to the presacral tissue. (**B**) Cross-section showing hemorrhagic areas and capsule. (Reproduced from Whitney, B. V.: An unusual retrorectal tumor, *U. S. Armed Forces M. J.* **5:** 1501–1508 (Oct.) 1954.)

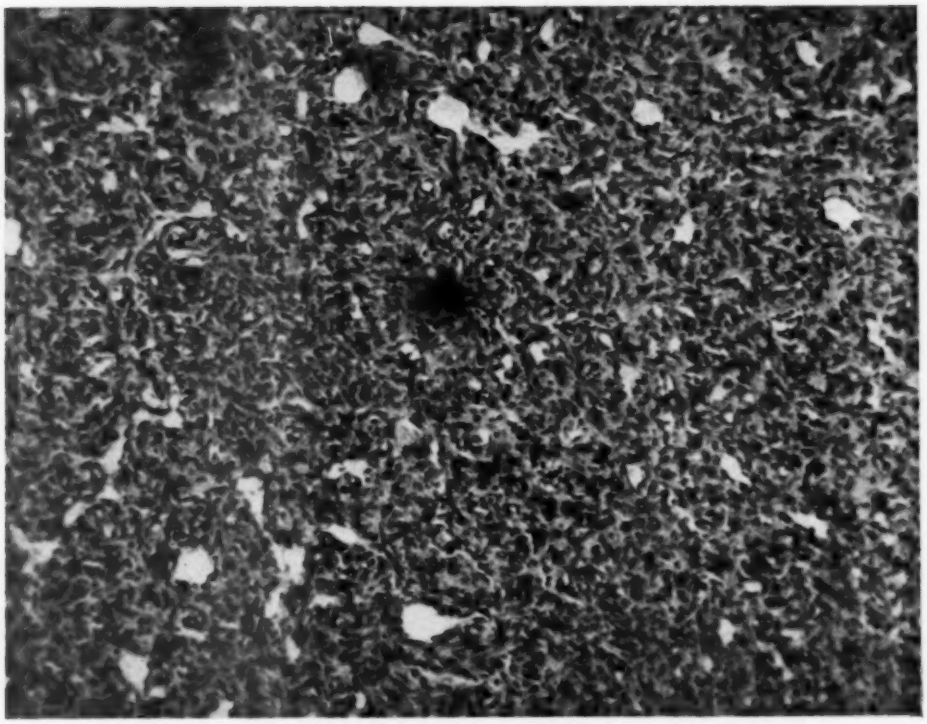

FIG. 4. Photomicrograph showing numerous small blood vessels lined by a single layer of endothelium. In addition there are many endothelial cells which tend to be arranged in a circular fashion about the blood vessels. (Hematoxylin and eosin stain, × 100.) (Reproduced from Whitney, B. V.: An unusual retrorectal tumor, *U. S. Armed Forces M. J.* **5:** 1501–1508 (Oct.) 1954.)

pelvis. By careful dissection the sigmoid was freed sufficiently so that it could be retracted medially. Both the right and left ureters were identified. It was then possible to reach the tumor and by manual dissection to free it from its attachment to the sacrum posteriorly and the rectum anteriorly. The tumor was delivered and sent to the pathology laboratory for frozen section. It was reported to be non-malignant. Considerable bleeding was encountered while removing the tumor, but this was remedied by whole blood transfusion. All bleeding was adequately stopped with ligatures, and the field was dry prior to closing the posterior layer of the peritoneum.

The patient did well postoperatively. Sigmoidoscopy on the eleventh postoperative day revealed the rectal mucosa to be intact, and he was discharged from the hospital on the thirteenth postoperative day. During the succeeding twenty-four months there has been no evidence of recurrence of the tumor. The patient is a barber and he is still active in his occupation. For one year prior to surgery he was unable to work, because of weakness and pain of the right leg after prolonged standing.

The tumor measured 10.5 x 8 x 7 centimeters. It was encapsulated, but was attached to the surrounding tissues by multiple fibrous adhesions. An anterior and posterior pedicle marked its firm attachment to the rectum and presacral tissue (Fig. 3). Microscopic examination showed elongated cells closely applied around the endothelial lining cells of the capillaries. There was a fibrous framework around the blood vessels, and the endothelial cells were located within the fibrous layer. Most of the vessels had little or no reticulin in their fibrous sheaths (Figs. 4 and 5). Dr. A. P. Stout reviewed the slides on this case and stated it was an hemangioendothelioma.

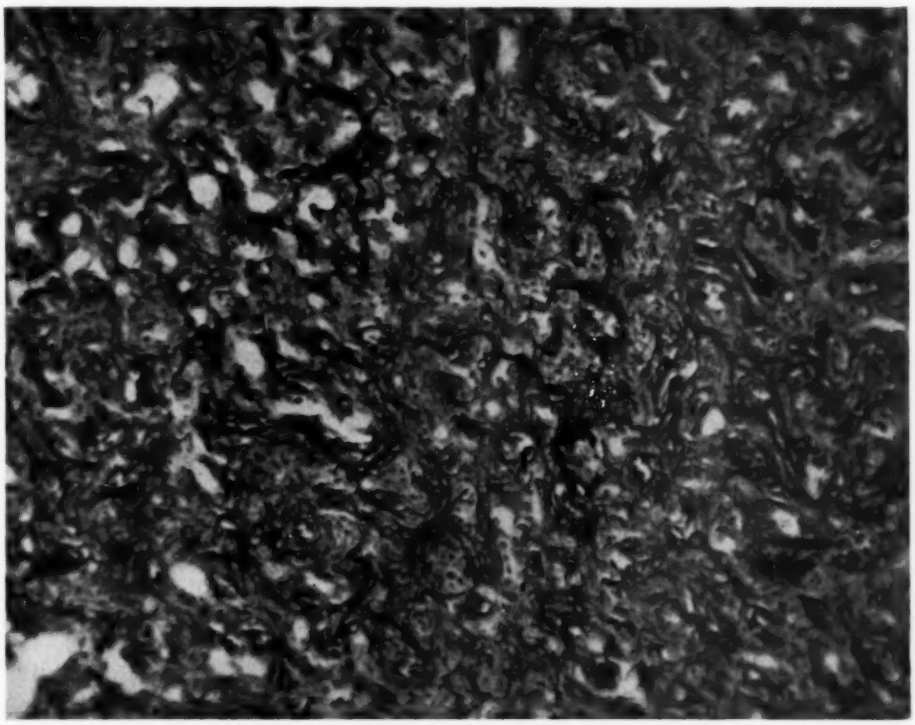

FIG. 5. Photomicrograph showing fibrous sheath of blood vessels and endothelial cells within the fibrous sheath. (Silver reticulin stain, × 100.) (Reproduced from Whitney, B. V.: An unusual retrorectal tumor, *U. S. Armed Forces M. J.* **5:** 1501–1508 (Oct.) 1954.)

SUMMARY

A classification of retrorectal tumors into seven groups has been presented for purposes of differential diagnosis. Necessary diagnostic procedures have been enumerated.

The malignant vascular tumors, hemangioendothelioma and hemangiopericytoma, have been discussed and a case of retrorectal hemangioendothelioma in an 81-year-old man has been presented.

The prognosis seems good in this patient, even though hemangioendothelioma in this age group is usually malignant. The tumor was slow-growing (two-year history of symptoms) and well encapsulated. It was removed completely. Twenty-four months have passed with no evidence of recurrence.

Acknowledgments

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PANEL DISCUSSION ON HEART DISEASE*

Panelists†: EDWARD D. FREIS, M.D.; MENARD M. GERTLER, M.D.; DAVID LEHR, M.D.; HARRY L. JAFFE, M.D.; HENRY I. RUSSEK, M.D., AND CHARLES F. WILKINSON, JR., M.D.

Chairman‡: EDWARD HENDERSON, M.D.

CHAIRMAN HENDERSON: This is an opportunity to ask this distinguished panel your questions. Cardiac disease kills more people today than all other diseases combined. Perhaps you will want to ask questions, for example, on the relationship between obesity and heart disease. None of our panelists is obese, you will notice.

DR. CRAMPTON, New York: Should adrenergic drugs be used in individuals with coronary difficulties?

CHAIRMAN HENDERSON: I think Dr. Jaffe can probably do justice to that question.

DR. JAFFE: We have used adrenergic drugs without harmful effects and there have been similar reports recently. These drugs do not seem to increase angina or heart failure. In the usual therapeutic doses, they do raise blood pressure appreciably. They are not contraindicated in individuals with coronary disease.

CHAIRMAN HENDERSON: Is there any difference between the activity of the racemic form and of the dextro-rotatory form? Does it make any difference whether the drug used is amphetamine or Dexedrine?

DR. JAFFE: I think that people vary in their reactions. It is perhaps a question of the individual reaction to the drug.

CHAIRMAN HENDERSON: Are there any other questions? If not, I should like to have the panel members ask each other questions. I think that will be the way to bring out the important phases of our subject.

DR. RUSSEK: I should like to ask Dr. Jaffe a question about the relationship of obesity to survival following acute myocardial infarction. Has he any statistics to indicate whether or not the obese patient fares as well as the patient of normal weight? I refer to statistics collected by Dr. Ancel Keys which suggest that the obese patient actually does better than the patient of ideal weight.

DR. JAFFE: I cannot give you definite statistics. Our clinical impression is that the obese patient does less well than the patient of normal weight but we have not compared mortality rates.

DR. GERTLER: I should like to ask Dr. Jaffe to define "obesity" and "overweight." These terms seem to be used loosely. When is a person overweight?

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What is the standard? How obese is an individual? What are the criteria for measuring obesity?

DR. JAFFE: I know Dr. Gertler's aim and should like to have him answer his own question. We have used the standard weight tables of 1912 and weight tables derived more recently from a large series of supposedly normal people who, for the most part, were working in war plants.

I know that Dr. Gertler has body build and the like in mind. He has some interesting ideas on the subject. Would you like to tell us about them?

DR. GERTLER: I think that the definitions of obesity and overweight are very loose and made without reference to definite standards.

The Metropolitan Life Insurance Company proposed the "large frame," "medium frame," and "small frame" in an attempt to standardize height, weight, and age in the so-called normal population.

When someone speaks of an obese individual, I don't know whether he means that a man has excess fat, or that he weighs more than his neighbor.

Let's take the animal population, for example, to show what I mean. There is a bacon hog and a lard hog. The bacon hog will always weigh less than the lard hog. Yet, no one will say that the bacon hog is underweight, nor can he say that the lard hog is overweight. They are two different species. You can find similar examples in other parts of the animal kingdom.

By the evaluation of body density as is carried out in the Navy, by x-ray examination for pads of fat, and so forth, attempts have been made to show when an individual is obese. I think, however, that human beings must be classified, as Sheldon has done, into somatotypes—ectomorph, endomorph, and mesomorph. The ectomorph will never become endomorphic or fat. The mesomorph will never become an endomorph; you can't make an endomorph lean and long like a broomstick when he already looks like a barrel. It doesn't happen that way.

Dr. Russek brought up an important point when he inquired as to the prognosis in heavy people versus light people as far as heart disease is concerned. We have found that coronary heart disease develops in the so-called mesomorph. The long, lean type of individual does less well than the mesomorph or endomorph. I particularly want to emphasize that differences are found among these three types of individuals in this respect.

The terms "obesity" and "overweight" are used loosely. I wish they could be removed from the lexicon.

DR. WILKINSON: I think both terms "obesity" and "overweight" should be discarded and the word "fat" used instead.

The Metropolitan tables, to my mind, are somewhat less than adequate.

We prefer to discontinue their use for persons over the age of 30 and to assume that the sedentary individual should lose 5 per cent of his ideal weight each five years over the next fifteen years. Thus, when he is near 40 he should weigh 15 per cent less than his ideal weight at age 30. After age 30, many of us sit around and don't play tennis any more. If we maintain our body weight from then on, we do not maintain muscle mass but rather add adipose tissue to replace the muscle mass lost through inactivity.

There may possibly be a species or type difference. We believe it is far less

significant than the natural loss of muscle mass that occurs in our present civilization at about the age of 30 years.

This does not include the people who have the Middle West compulsion for exercise, and who play handball up to the age of 60. I am talking about those of us who, after medical school or college, tend to become sedentary.

I make a plea to reduce the weights in the tables after the age of 30 rather than to increase them, as Metropolitan Life does.

DR. FREIS: I should like to ask Dr. Wilkinson whether or not there is sufficient evidence to justify a low-fat diet in patients with coronary heart disease.

DR. WILKINSON: We do not use it. The only experimental evidence I know with which I could concur is afforded by Dr. Kinsell's work with vegetable fat. He does not reduce the ingestion of fat but tends to maintain or increase the intake of vegetable fat.

We have no reason to believe that the low-fat diet is necessarily a good diet, unless these people have a secondary hypercholesteremia; then we lower the blood fats with a low-fat diet. In the hyperlipemic patient with secondary hypercholesterolemia, the blood lipids can be reduced to the normal level with a low-fat diet. We have not been able to obtain this reduction in patients with primary hypercholesteremia or in normal individuals.

DR. LEHR: I should like to ask about the use of cortisone. Does Dr. Russek believe that it is the euphoric action that is the basis for the beneficial effect in apoplexy? It seems to me that retardation of healing is not desirable in such instances. Also, I wonder whether or not he would consider the possibility of using other euphoric drugs like Demerol in his controls, in order to prove that cortisone really is effective?

DR. RUSSEK: The use of controls in acute cerebrovascular occlusions is a proposition that presents great difficulty. It is difficult to match controls in such a disease.

We have been impressed with the cerebral effects of cortisone. They seem to be most marked and most desirable. Just how much benefit is derived as a result of the effect of the steroid on the lesion in the brain and the resulting edema, is difficult to say.

I believe that in the brain the situation is different from that elsewhere in the body where an inflammatory reaction may be desirable. In the brain, where the vitality of the cells is such that anoxia may produce irreversible changes, it may be advisable to reduce the inflammatory response to necrosis and anoxia. Of course, this is purely in the realm of theory—we don't know what is happening.

We have observed what appears to be a beneficial response when giving cortisone to patients with acute cerebrovascular occlusion.

CHAIRMAN HENDERSON: I should like to ask the members of the panel whether or not in their opinion the use of vegetable fat, as opposed to animal fat, would be advantageous—for example, oleomargarine instead of butter, or a hydrogenated vegetable shortening such as Crisco instead of lard.

Dr. Wilkinson, you have had experience along that line? Would that be a sensible suggestion to make to persons with heart disease?

DR. WILKINSON: We have performed several experiments in which the visible

animal fat was removed and vegetable fat substituted. Bear in mind that this differed from Dr. Kinsell's regimen, in which all vegetable fat was used. It was like the fat-free diet given in general hospitals, in which there is no visible fat—in other words, the butter was removed from the plate, and so on. There was still 50 grams of fat in the diet and it was usually animal fat. To give a purely vegetable-fat diet means that no animal products whatsoever are consumed. Your lamb chops have to be made from walnuts, your steaks from hickory nuts.

To answer your question directly, I would say that our experience has been with removing visible animal fat—*e.g.*, cutting all the visible fat off the meat, removing butter, and using skimmed milk or reconstructed milk—and substituting one of the vegetable fats, in a diet that contains approximately 50 grams of fat. Whether the fat is animal or vegetable makes no difference.

Dr. Kinsell's work was carried out with vegetable fat alone. No animal source of food was involved. The results indicate that such a diet does tend to lower the level of blood cholesterol. This may not be good. We should like to find a method of lowering the blood cholesterol level so that we could study it over a period of ten or fifteen years and find out if it is beneficial.

DR. GERTLER: I should like to add to the remarks of Dr. Wilkinson, with which I wholeheartedly concur. I wish to call your attention to the recent study of Ahrens at the Rockefeller Institute. Synthetic diets were prepared and fats of various chain lengths were employed. He showed that the levels of serum cholesterol and certain lipids were altered in various ways, depending on the type of fat used.

DR. LEHR: I have two questions to ask. One is directed to Dr. Wilkinson and to Dr. Gertler. Is too much attention being devoted to one aspect of this matter, namely to cholesterol and fats? Are we not forgetting other important aspects that are older and may come back into the cycle? I mean, primary arterial damage, especially to the media. Many pathologists still believe that primary damage to blood vessels is necessary for fat deposition to occur.

I mention this because I am at present engaged in this type of study, that is, producing primary vascular damage and then trying to see what effect cholesterol will have.

I wonder whether the panel will answer this question.

I have another question to be directed to Dr. Freis. Will he discuss the danger of treating hypertension in the aged with hypotensive agents.

DR. WILKINSON: I would be the last to say that cholesterol causes arteriolosclerosis. In fact, for a couple of years I was a voice crying in the wilderness saying that it does not.

There is no doubt that trauma, that is, the bending of coronary arteries, has a great deal to do with the site at which the plaque is deposited. I should like to know whether any of the pathologists here has seen a plaque after an artery is surrounded by muscle. I have never seen a plaque develop after an artery was surrounded by muscle. The plaque develops in the free part of the artery where it bends the most.

As for lipid deposit, a far more important factor is the total amount deposited in an artery over a lifetime than is hypercholesteremia.

Stress is something we think we can measure in some individuals, measure with uncertainty in others, and which we frequently cannot measure under any circumstances. Our laboratory now is interested in various types of stress and their results. I should certainly agree that trauma, hypertension, and stress—and that is a vague term—are at least half of the picture. If I implied today that cholesterol was or was not the whole picture, I apologize for it.

DR. FREIS: The danger attendant upon treatment of marked hypertension in the aged with hypotensive drugs would be from thrombotic occlusion of a cerebral or coronary vessel. Surprisingly, this seldom occurs. I can recall only one instance of a myocardial infarct, and several instances of cerebrovascular accidents occurring during marked hypotension. The paralysis cleared within a space of four or five days. Not infrequently it has been observed that, in a patient with a cerebrovascular accident and paralysis on one side, the paralysis has recurred upon sudden reduction of the blood pressure. When the blood pressure has again been elevated, either by putting the patient head down or giving 100 per cent oxygen, the paralysis has again disappeared.

There is an important difference between the hypotension induced by hypotensive drugs and that induced by surgical shock or shock from hemorrhage. In the former one is dealing with vasodilatation and normal blood volume; in the latter one is dealing with vasoconstriction, reduced blood volume and the many compensatory reactions that occur. These situations are not necessarily the same. My observation has been that myocardial infarction in the aged is less common in shock due to hypotensive drugs than in shock due to hemorrhage.

There is one real danger with hypotensive drugs. It is foolhardy to try to reduce blood pressure in patients with borderline renal function or renal failure. If renal disease is present in mild degree, the reduction should be gradual.

Great care should be exercised in reducing the blood pressure in the elderly patient, but one need not be deterred by fear of inducing a thrombosis, provided there are good indications for reducing blood pressure.

DR. JAFFE: Some of us have not had good results in treating hypertensive patients in ordinary office practice. I should like to ask Dr. Freis what percentage of patients in his experience respond to these drugs?

DR. FREIS: I think that one of the difficulties with office practice is that judgment is based upon office blood pressures. I wish to stress the importance of obtaining basal blood pressures. I would say that about 70 per cent of patients on office visits will show an escape from the hypotensive effects of their treatment, whether the drugs used be ganglionic blocking agents or other agents. If we were guided only by office pressures, we would conclude that such drugs were largely ineffective, and toxic in effective doses. This is an important point. These drugs primarily affect blood pressure under basal conditions and not blood pressure during stress.

I don't know why you have had poor results. All I can say is that we have had fairly good results. I suggest this as one possible reason why your results were poor.

DR. WILKINSON: I want to ask Dr. Freis a question. It has been mentioned that one of the effects is depression and that the patient should be warned against this and told to stop the drug.

I wonder if this is sufficient precaution. We know that when a patient takes a certain amount of any barbiturate, for instance, there develops what we call automatism and the patients keep on taking it. I wonder if the same type of reaction might not develop in a depressed patient. Even though he were warned against continuing the drug, he might continue taking it. Instead of warning the patient, perhaps we should check him at more frequent intervals.

DR. FREIS: You are probably right, Dr. Wilkinson. I think the important thing is to call it to the attention of physicians so that they will be on guard.

It is not an anxiety type of depression but rather lethargic and, unless it is kept in mind, it is apt to be missed. I agree with you.

DR. GERTLER: I should like to address another question to Dr. Freis. When a patient with hypertension comes to see you in the hospital or office, what yardstick do you use to enable you to choose a specific drug for him?

DR. FREIS: That requires a long answer. I might say that the decision is based not upon blood pressure alone, but upon examination of the optic fundi, the level of renal function, the level of cardiac compensation, the age and sex of the patient, a history of strokes, the degree of complicating atherosclerosis, and upon many other factors.

As for treatment and the choice of medication, they are based upon our best estimate of the prognosis in the individual patient. If, on the basis of our work-up, we think he is going to live less than five years, we treat him intensively and if necessary, use (in a younger patient, but not in an elderly one) a ganglionic blocking agent or any procedure that will reduce his blood pressure without severe toxic effects.

If, however, the patient has moderate hypertension, we are apt to begin with the least noxious of the various agents and proceed, if necessary with more potent agents, to the point at which either a reduction in blood pressure is obtained, or side effects are observed which appear to make the treatment not worthwhile.

The whole procedure is a matter of working within the limitations of the available drugs in order to obtain the best results in the individual case. The yardsticks used in selecting a specific drug, therefore, will depend upon the severity of the hypertension (as judged by the multiple criteria just mentioned); the potency, side effects and difficulties in adjusting dosages of each drug; and the patient's emotional temperament and willingness to cooperate.

CHAIRMAN HENDERSON: I should like to ask Dr. Russek if he has found intravenous cortisone to be useful in the treatment of these acute cases? Sometimes the patients are so ill that they cannot swallow the drug. Have you used it intravenously?

DR. RUSSEK: We have not used it intravenously; we have used it intramuscularly in such patients.

CHAIRMAN HENDERSON: If there are no more questions, I should like to thank all of you for coming to this Symposium, which has been tremendously successful. I should like also to thank particularly the participants, the members of the faculty, and these distinguished cardiologists for their wonderful presentation.

PROBLEMS OF IMPOTENCE IN AGING MALES

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The principal problems of aging males in attempting coitus are 1) achieving a satisfactory erection, 2) continuing the act and not disappointing the sexual partner by premature ejaculation, and 3) achieving orgasm, even though erection is easy and lasting. If the wife is in the child-bearing age and offspring is desired there is the additional problem of fertility.

Concerning the incidence of impotence, the best available statistics are found in the compilations of Kinsey *et al.* (1). The following excerpts are significant. "Impotence is clearly the product of a great diversity of physical, physiologic, and psychologic factors, and in each individual case a multiplicity of factors is likely to be involved."

These authors feel that impotence is a relatively rare phenomenon and that it should be pointed out to clinicians, especially the urologists and endocrinologists, that "a clinic is no place from which to get incidence data." They also conclude that impotence in a male under 55 years of age is "almost always the product of psychologic conflict, except in those exceedingly few cases where there has been mechanical injury—or disease has interfered with nervous functions."

Data on 4,108 males warranted the following deductions by Kinsey and his co-workers: "There are stray cases of impotence between adolescence and 35 years of age. Between 45 and 50, more males become incapacitated, and after 55 the number of cases rises rapidly. By 70 years of age, about one-quarter (27.0%) of the white males have become impotent; by 75 more than half (55.0%) are so; and 3 out of 4 white males in the 80-year group are impotent."

The preceding estimates are much more encouraging than earlier ones, such as those of Vecki (2): "Sexual impotence in old men may therefore be considered physiological. It is claimed that the sexual power begins to diminish around the fifties and is usually extinguished when the man reaches the age of sixty-five."

It is conceded on all sides that cases of organic or somatogenic impotence are greatly outnumbered by the functional or psychogenic type. Levie (3) states, "In only 9 of our personal material of 1200 men could an organic cause be established (phimosis, tabes dorsalis, diabetes mellitus, plastic induration of the penis, partial transverse lesion of the spinal cord). This means that a psychogenic cause was established with certainty or considered most probable in 99% of cases, somatogenic causes being found in less than 1% . . . the ratio 99:1 is reasonably accurate with regard to patients who complain exclusively or mainly of disturbances of potency." This author continues: "An organic cause is excluded, when the history reveals that the various phases of the sexual act do not fail at times or under conditions other than those of the attempt at coition.

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These phases of the sexual act are: libido, erection, ejaculation and orgasm." He concludes that in differential diagnosis one should lay stress not so much on the absence of orgasm and ejaculation during coition, but rather their presence in nocturnal emissions or in masturbation. It may logically be added that morning erections give evidence of anatomic and physiologic soundness, thus ruling out an organic cause.

It is a well established fact that octogenarians and nonagenarians have become fathers. To quote Levie again (3), "One factor I want to emphasize: age never can be responsible for a disturbance of potency! It is true that with the advance of years the number of cohabitations decreases but qualitatively potency will be preserved in physically and mentally normal men till the end of their lives."

In an excellent paper containing a pertinent account of recent advances in the knowledge of the functioning of the generative system Baum (4) writes of the nervous system integration: "There appear to be three primary responses to erotic stimuli; 1) a general response motivated by the autonomic nervous system, 2) an erectile response motivated by the parasysmpathetic and somatic nervous system, and 3) an ejaculatory response resulting from sympathetic and somatic nervous system activity. It has been shown that the erotic stimuli which give origin to these three major reactions may themselves arise from two sources; 1) suprasegmental, or higher center, 2) and the other, more basic, lower reflex activity."

"The general reaction is one of excitation of the entire autonomic system with increased pulse rate, rise in blood pressure, and increase in peripheral blood flow, as well as a diminution of auditory and visual senses. Accompanying this autonomic response is a certain somatic reflex activity characterized by spastic contraction of the extensor muscles of the lower extremities. Commonly, the mechanism of erection has its origin in tactile afferent stimuli mediated over the pudenal nerve (somatic) which synapse in the sacral cord, segments two, three and four, and from there pass as efferent stimuli over the pelvic nerve (parasympathetic) to the prostate gland and seminal vesicle where they give origin to secretory activity and to the arterioles supplying the corpora cavernosa and corpus spongiosum to which they are vasodilatory, and to the muscular walls of the blood sinuses to which they are inhibitory. As a result, engorgement of the vascular spaces occurs. Engorgement is maintained to some degree by efferent impulses mediated back over the pudendal nerve (somatic) to the striated muscle of the ischio-cavernosus and bulbo-cavernosus which compress the efferent veins."

Writing of changes in later life Baum continues: "Undoubtedly, reduction in the local blood supply is a major factor in this gradual decline. Certainly, endocrine failure, genetic constitution, and vascular supply must all play their part."

TREATMENT

Before attempting to treat a patient complaining of impotence it is essential to determine if the underlying cause is organic or psychogenic.

Organic impotence is due either to anatomic malformation or to disease. If medical and surgical treatment can remove the anomaly or the lesion, relief should be obtained.

Since it is well recognized that impotence in the vast majority of cases is mental, treatment must be directed toward a relief of the underlying trauma. Kinsey (1) states: "There is even some evidence that much of the impotence which is seen in old age is psychologic in origin." If the physician can not put his finger on the exact cause of the trouble, in so far as eliminating hidden factors is concerned (and this will often be the case), there are other approaches to the problem.

First of all the patient should have a thorough examination in order to rule out somatic causes, such as mild myxedema. A careful check by a urologist is entirely in order, with particular attention to the condition of the prostate. Other indicated examinations should be made.

Reference should be made here to the work of Biskind (5) on the effects of adequate administration of essential nutritive substances in the alleviation of sex-endocrine disorders. He recommends the use of nutritional extracts of liver fortified with crystalline B vitamins, and also desiccated whole liver, either fortified with B vitamins or unfortified. He states "The effect on libido and potency of administration of adequate amounts of liver, is often among the most dramatic observed in medicine."

If all examinations reveal nothing of serious import, one or more of the following methods of treatment may be tried.

1. *Education*

Give the patient a short lecture on the physiology of erection, with an explanation of the nervous mechanism in language he can understand. Emphasis should be placed on the fact that there are two kinds of erections: 1) the cerebral type, brought about largely by the influence of the higher centers, and 2) the tactile or reflex type, brought about gradually by massage of the penis. Many a man thinks he is "over the hill" because he can not achieve erection as he formerly did, simply by the imminence of coital action. Most such men think they are impotent, whereas they are merely slow in attaining erection. After five to fifteen minutes of penile massage by the wife, using a suitable lubricant, a perfectly satisfactory erection may often result and one that is lasting—far better in fact than the quick erections and almost immediate ejaculations of the young, sthenic individual.

This may be all that is needed in many cases, but if not, further education of the patient is in order—explaining the actions of the sympathetic and parasympathetic nervous systems on the process of erection and coition.

2. *Drugs*

It has been shown by Loewe (6) that stimulation of the parasympathetic and sedation of the sympathetic nervous systems in white mice will cause ejaculation

without reference to, or contact with the female. A barbiturate was used to quiet the sympathetic, and yohimbine to stimulate the parasympathetic.

Stimulants and sedatives. Although yohimbine seems to have reached the state of innocuous desuetude, strychnine is still available, although difficult to obtain in the desired dosage and form. The enteric-coated pellets are useless; only the hypodermic tablets are satisfactory. The dosage may be 1/20 grain at intervals of two hours for four doses, as prescribed by Huhner (7), or 1/30 grain at one-hour intervals, which we have found efficacious and more convenient. If only 1/60-grain tablets are available, two may be prescribed for each of the three doses. One dose may be taken at dinner, one from an hour to an hour and a half later, and one at bedtime. In cases of psychogenic impotence, in which the inhibitory influence is not too strong, a better erection and a more lasting one will ensue. Older individuals can as a rule continue coitus considerably longer than most young men and will often find that erection will persist for a minute or longer after ejaculation when the act has been protracted for fifteen minutes to an hour, somewhat in direct proportion to the duration. It is not unlikely that larger doses would be well tolerated and have an even more potent effect.

The sedative may be selected by the physician to suit his own preference. Barbiturates are good. The quick-acting ones are indicated. Small doses of alcohol, such as whisky or beer, are effective in persons who do not drink much, but in others do not give good results. Adequate sedative dosage with a barbiturate will likely be found more desirable.

Androgens. Substitution therapy with androgens may or may not be indicated. If the 24-hour output of 17-ketosteroids is normal or high, it is unlikely that much benefit will be derived, in so far as the chief complaint is concerned. Androgen is an anabolic, protein-storing hormone, and will usually make the patient feel much better; it should aid in making the treatment with sedative and stimulant effective. In patients with a low output of the steroids, adequate treatment by injection or pellet implantation may be most beneficial. Because of the greater cost of treatment with pellets, it is advisable to give a course of injections, weekly or semi-weekly, in order to determine the effect. One hundred milligrams of testosterone once a week will usually prove sufficient for such a test. The required number of 75-milligram pellets will vary from six to nine.

The alleged carcinogenetic effect of male sex hormones, as well as female sex hormones has been greatly overemphasized. It is generally conceded that testosterone will not cause cancer, but if cancer be already present, it is the consensus that the malignant growth will be aggravated.

Since the sex hormones decrease in quantity as individuals grow older, it is contradictory to assume that the smaller amounts in the so-called 'cancer age' (middle-life or later) are more apt to give rise to cancer than the larger quantities during the principal reproductive period.

Parkes and Bellerby (8), Margaret Smith (9) and the present writer (10) demonstrated that sufficient doses of female sex hormone would terminate pregnancy in, respectively, white mice, white rats, and guinea pigs. Our intention was to propose this method for use in therapeutic abortions and over-term preg-

nancies. This was later tried in humans by Robinson *et al.* (11) but was not effective, although doses as high as 6,800,000 international units of estrone were administered. This research was the subject of an editorial in *The Journal of the American Medical Association* (12). The important deduction is that cancer did not develop in any of the patients as a result of the enormous dosage.

The existence of the male menopause as a clinical entity is espoused and discounted from time to time. The work of Heller and Myers (13) and of Werner (14) was significant, but the most recent *J.A.M.A.* editorial on this subject (15) concludes that such a syndrome has not been firmly established. We share that view. In this connection it is necessary to call attention to an important differential diagnosis between 'male menopause' and (involutional) melancholia. Many of these patients will admit that they have contemplated suicide and some of them will give in to that impulse if they do not receive proper treatment. Androgens will not help. If the patient insists he is not impotent, the course is crystal clear; send him to a psychiatrist.

Impotence may be relative, to the extent that a particular man may be potent with one woman and not another, or under one set of circumstances and not otherwise. A patient of mine recently asked if most of his trouble could not be his wife's fault; he said she was drinking a great deal and was very unattractive as a result. It is the duty of the physician to treat the patient, but not to provide him with a new and more erotic environment.

Local anesthetics. For eight years the present writer has been carrying on a clinical investigation of the effects of local anesthetics in premature ejaculation. Nupercaine has been found most satisfactory in selected cases. In the young or middle-aged man who attains erection with ease, this anesthetic is very effective in adequate strength. The 1 per cent ointment obtainable at all drug stores may suffice for most men, but others require a stronger preparation, such as the 5 per cent ointment.[1] In elderly men, however, or whenever erection is difficult, such treatment is contraindicated, for it militates against the production of the tactile type of erection so often required in such patients. Although scores of patients have been issued the 5 per cent ointment, there has not been a single report of local irritation or loss of sensation after two or more years of use.

Local stimulants. For the elderly patient who can achieve erection but can not reach orgasm, a stimulating ointment may be of help. The one we have found useful contains 30 grains of camphor and 15 grains of menthol, made up to one ounce with petrolatum. One-fourth grain of oleoresin of capsicum may be added if necessary, to obtain a more stimulating effect.

Mechanotherapy. We strongly recommend the use of the Coitus Training Apparatus in certain cases. This is a well made device manufactured in London by Down Bros. and Mayer and Phelps, Ltd., and has an important place in the treatment of stubborn cases of psychogenic impotence. It should not be compared with the comically named 'Wimpus' and its imitators sold in this country. Loewenstein (16) has written a small book on the subject of its use, which was

[1] The Nupercaine ointment used in our studies was generously supplied by Ciba Pharmaceutical Products, Inc.

recently reviewed (17). The principal difficulty is in obtaining an exact fitting, which is essential for satisfactory results. When properly fitted, this instrument will carry the flaccid penis into the vagina. Under suitable conditions, erection may then occur. It is used with the expectation that eventually it will no longer be required.

Androgen-FSH. Lack of fertility will occasionally become a problem for the aging husband, if the wife is in the childbearing period of life. Possibly spermatogenesis may be stimulated by injection of small doses of testosterone or, even better, by treatment with follicle-stimulating hormone, if present investigations prove its merit.

* * * * * *

The writer agrees with Vecki (2), who believed "that satisfying real sexual wants is advantageous to old age, as it contributes to stimulate the energy in the assimilation of material; it buoys up and makes the heart rejoice; it helps to keep up cheerfulness, which is generally reduced in old people, and therefore may properly be considered as a means of favoring longevity. Malchow calls it 'the rejuvenating influence of conscious possession of an ability for the expression of love.'"

In conclusion, we should like to make a plea for much more active research in this field which is so intimately entwined with human misery or happiness.

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FATAL SUPPRESSION OF SYMPTOMS DURING HORMONE THERAPY

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In the last decade medical science has seen the introduction of ACTH and cortisone therapy. Both these drugs have been used in a wide variety of diseases with, in some instances, dramatic success (*viz.*, Addison's disease) and in others little effect.

During recent years there have been numerous publications about these drugs, comparing the therapeutic response obtained with that of old, well-tried remedies. The experimental aspect of the effect of these drugs on animals, with respect to their disseminating properties in bacterial infection, also has been frequently stressed, as has the theoretical causation.

It is with reference to the practical aspect of this dissemination of infection, coupled with the almost complete suppression of symptoms of the resultant pathologic lesion, that the following 2 cases are presented:

Case 1

A housewife, aged 65, was admitted with an acute generalized exacerbation of her rheumatoid arthritis, precipitated by purulent rhinorrhea and sinusitis. On admission, she had cardiac failure, pyrexia, generalized swelling and joint pain, and was unable to sit up in bed by herself. She had lost about 21 pounds (9.5 Kg.) in weight in the preceding three months. The erythrocyte sedimentation rate (E.S.R.) (Westergren) was 110 mm. in one hour, hemoglobin 52 per cent, and B.P. 160/90. She had a stormy course of remissions and exacerbations, eventually being discharged to a convalescent home eight months after admission.

During her stay in the hospital she was at first given 50 mg. of cortisone daily by injection, combined with a short course of penicillin and Digoxin. In two months she had improved to a degree where a reduction in the dose of cortisone to 37.5 mg. daily was reasonable. However, she rapidly had a further exacerbation of her symptoms, which failed to regress on a dose of 75 mg. of cortisone daily. It was decided that the cortisone should be replaced by ACTH. She was started on 60 mg. of ACTH daily in October. She improved rapidly, enabling us to reduce the dosage to 20 mg. of ACTH gel daily within a fortnight. Steady improvement was maintained, and therapy was discontinued. Within a week she had a further exacerbation of the rheumatoid arthritis and purulent rhinorrhea, which necessitated another course of penicillin combined with 100 mg. of cortisone daily. Her symptoms gradually improved, and a reduction of the dosage to 75 mg. of cortisone daily was possible. It was found, however, that any further reduction in cortisone resulted in an immediate exacerbation. She was discharged in February 1954, to continue taking 75 mg. of cortisone daily. At this time, she was able to walk with the aid of two sticks and had gained 14 pounds (6.4 Kg.) in weight.

During her stay in the hospital she had three short courses of penicillin, and two courses of intramuscular iron, cortisone and ACTH.

She was seen in the out-patient department a month after discharge and appeared very well, having no joint pains and being able to walk unaided. She was sent home to continue taking 75 mg. of cortisone daily. At this time the E.S.R. was 26 mm., and hemoglobin 80 per cent.

Three weeks later she died in her sleep, having been normally active throughout the day and making no complaint whatsoever. Her brother said that a few days previously she had been better than she had been for years, being more active and able to perform her housework with more ease.

Post-mortem findings: Macroscopically there was a bilateral hydrothorax of approximately 2–3 pints (1,140–1,700 ml.), with a bilateral early confluent basal bronchopneumonia. The heart musculature was thin and of poor texture. The pericardium was adherent anteriorly. The liver showed passive congestion. The kidneys appeared normal. There were typical rheumatoid arthritic joint changes. The suprarenals were normal (right, 5 grams; left, 5.5 grams). The pituitary was normal (weight 0.9 gram). Histologic examination showed that the suprarenals and pituitary were normal for her age. The myocardium showed mild toxic myocarditis. The liver showed cloudy swelling, with an increase of red cells in the portal tract. The kidneys were normal. The sternal marrow was of normal cellularity and the thyroid gland showed normal activity, with small lymphoid accumulations. The lung was not examined histologically.

Case 2

An electrical engineer, aged 55, was readmitted in early January 1954, because of gradual deterioration of his rheumatoid arthritis during treatment with 400 mg. of phenylbutazone daily, which he had been taking for about a year. He complained of pain in all his joints, especially the right elbow and both shoulders. The E.S.R. (Westergren) was 12 mm. in one hour; hemoglobin 95 per cent; W.B.C. 13,400 (polymorphs 84 per cent, lymphocytes 9 per cent, monocytes 7 per cent). The same dose of phenylbutazone was continued together with a short course of ACTH, beginning with 20 mg. of ACTH gel daily by injection; this dosage was reduced to 10 mg. daily twelve days later. Four days afterward he complained of difficulty in respiration, due to inspiratory stridor, which failed to respond immediately to subcutaneous adrenaline. He was given 50 mg. of crystalline ACTH intramuscularly; this dose was repeated twice in the next forty-eight hours, by which time the attack had abated. He was given a short course of penicillin because his throat swab revealed hemolytic streptococci, not Lancefield group A or O. The E.N.T. opinion record queried chronic inflammatory laryngitis secondary to crico-arytenoid arthritis. The phenylbutazone was discontinued and 10 mg. of ACTH gel daily was continued for a further fourteen days, in which time he felt much better and his joints were greatly improved. On withdrawal of ACTH he had a mild flare-up of his symptoms, which were brought easily under control by aspirin. He was discharged in the latter part of February.

In the latter part of April he had an acute flare-up of all his joint symptoms and was admitted to a nursing home, where he started on 20 mg. of ACTH gel daily. Seven days later he was symptom-free and feeling so much better that he was planning his return to work. That evening he went to sleep at a normal time but awoke in the early hours of the morning, short of breath. He died within six hours.

Postmortem findings: Macroscopically the left pleural cavity contained dense pleural adhesions along the anterior margin of the lung, due to a fibro-purulent exudate from a fairly recent pleurisy; there was some free fluid. The right pleural cavity was obliterated by dense adhesions, but there was no free fluid. The right lung was edematous. The left lung showed congestion and edema of the lower lobe. The upper lobe was totally consolidated and in a state of grey hepatization. The pharynx and larynx were healthy and normal. There was moderate enlargement of two mediastinal glands. Both the kidneys were congested. The heart muscle appeared to be normal, but there was a finely patent foramen ovale in the interatrial septum.

Histology: Lungs: the presence of acute pneumonia was confirmed, as a purulent exudate filled the alveoli; the left lung was in a stage of grey hepatization. Heart: slight coronary atheroma; nothing else abnormal. Liver: moderate fatty change and evidence

of chronic venous congestion. Kidney: evidence of toxemia, with cloudy swelling of tubular epithelium. Spleen: congestion of sinusoids; Malpighian corpuscles small, with relative deficiency of lymphocytes. Hilar lymph nodes: reactive hyperplasia and evidence of early pyogenic infection. The suprarenals were normal (right, 6.6 grams; left, 6.7 grams). The pituitary was also normal.

DISCUSSION

These cases occurred in a large rheumatic clinic where cortisone and ACTH are frequently used as an adjunct to physiotherapy and hydrotherapy, as well as for maintenance in refractory cases in domiciliary practice.

It will be seen that the 2 cases reported differ in two main respects. In Case I, the patient had been having hormone therapy over a period of months and was at the time of death controlled adequately on a daily dose of cortisone. In Case II, the patient had had a course of ACTH during a recent admission and was in a nursing home undergoing a further short course for an acute exacerbation. He had had only six injections of 20 mg. of ACTH gel.

In both cases the patients stated that they felt very much better than they had for some time—in spite of the gross pneumonia present in both. There did not appear to be any limitation of the physical activity.

The practical implication of these 2 cases, in the light of present knowledge, is rather disturbing. It would seem that all patients undergoing hormone therapy of this type require repeated complete clinical examinations, not more than a week apart. The onus for these examinations will of necessity fall on the shoulders of the general practitioner under whose ultimate care many of these patients will come.

It cannot be stressed too often that these drugs should be used under close supervision, for, in their present form, there are too many side-effects of fatal consequence. These effects are dissemination of bacterial infection, anaphylactic shock and water retention.

SUMMARY

Two cases of fulminating pneumonia in patients undergoing hormone therapy for the control of rheumatoid arthritis are described.

Both cases displayed the well known masking effect of cortisone and ACTH over severe bacterial infection.

The cases differ in that one patient was undergoing prolonged cortisone therapy, whereas the other patient had been receiving ACTH for only one week.

The problem of diagnosis is discussed.

Acknowledgment

I am indebted to Dr. G. D. Kersley for his help and advice in preparing this record and for allowing me to report these 2 cases; also to Dr. H. J. Gibson for furnishing the postmortem and histologic reports.

MORTALITY IN THE UNITED STATES AND IN OTHER COUNTRIES OF LOW MORTALITY

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Some thirty years ago, a death rate as low as 10 per 1,000 population was not regarded as a very likely prospect for the United States. With an aging population, it was expected that there would be an upturn in the crude death rate before it dropped below 10. However, the death rate continued to decline, and a rate of 10 per 1,000 population was first reached in 1946. The crude death rate dipped below that level in 1948, and since then it has been consistently below 10. In 1950, it dropped to 9.6 and then to an estimated rate of 9.2 per 1,000 population in 1954.

The death rate for 1954 was the lowest recorded in the history of the United States, but even lower death rates were reported for other areas of the world. In 1952 and 1953, there were at least 8 countries reporting death rates lower than that for the United States. According to a recent publication of the United Nations,[1] the crude death rate for Iceland was 7.3 per 1,000 population; for the Netherlands, 7.7; Norway, 8.3; Denmark, 9.0; Canada, 8.6; New Zealand, 8.8; Australia, 9.1; and Japan, 8.9. There were other countries that reported equally, if not more, favorable death rates. However, a low recorded crude death rate does not necessarily signify low mortality. In many areas of the world, the death rate is low because of incompleteness of registration of deaths.

There is no generally accepted definition of "low" mortality, and there is no one method that will delineate satisfactorily areas of low mortality. For the purpose of this discussion, the "life expectancy at birth" will be used as a measure, and countries with low mortality will be defined arbitrarily as those populations with life expectancy at birth which exceeds 65 years for the most recent year for which such data are available. Such a definition would exclude Iceland and Japan as countries of low mortality, although the crude death rates in those countries are low. On the other hand, several countries with relatively high crude death rates would qualify. These are Sweden, Belgium, England and Wales, Scotland, France, and Switzerland. The crude death rates for these countries are unduly influenced by a relatively high proportion of the population in the older age groups.

MORTALITY TRENDS

The level of general mortality for areas of "low" death rates varies over a wide range. The lowest recorded crude death rate in 1950 was 7.5 per 1,000 population for the Netherlands, and the highest was 12.6 for France. All of the

* Chief, Mortality Analysis Section.

[1] Statistical Office of the United Nations, "Population and Vital Statistics Reports," Statistical Papers, Series A, Vol. VI, No. 4, United Nations, October, 1954.

crude death rates except those for France, Belgium, Scotland, England and Wales, and Switzerland were 10 per 1,000 population or lower in 1950.

Recent mortality trends for these areas are somewhat difficult to describe because of the intervention of World War II. Countries that were under hostile attack or under enemy occupation experienced severe upswings in mortality during the early 1940's. The death rates for the other countries were also higher during the war years in varying degrees, because of the movement of the armed forces for foreign duty. Since neither members of the armed forces overseas nor deaths among them occurring outside the country are usually included in the computation of death rates, and because the armed forces come from a segment of the population with normally low death rates, the death rates during the war years were generally artificially increased by the effects of troop movements, and hence are not comparable with the prewar and postwar death rates.

The trends of crude death rates show several different patterns (Fig. 1). Despite the existing differentials in the levels of mortality, these patterns appear to be similar within certain geographic locations.

North America

In the United States and Canada, there was a slowing up in the rate of decrease in the crude death rates in the decade prior to World War II. In the mid-1930's, there was a brief period of upswing, after which the course of mortality resumed its trend downward. The recorded crude death rates for Canada and the United States were somewhat higher during the war, but a good part of the change was due to the technicalities of rate computation, that is, the exclusion from the numerator and the denominator of the rates, deaths and population, respectively, of the armed forces overseas. The overall death rates for Canada and the United States follow an amazingly parallel course, with Canada recording lower rates.

The age-specific death rates (Table 1) for Canada and the United States indicate a continuous decline in mortality at every age. The rate of decline during the prewar years was greater in the United States, whereas in the postwar period this has not been consistently true. In general, the decrease in rates has been greatest in the younger age groups and the average annual decrements least in the older age groups.

Europe

The areas of low mortality in Europe may be conveniently described in three groups: 1) the Scandinavian countries, 2) areas of the United Kingdom, and 3) a group of other countries on the European Continent, specifically, France, Belgium and Switzerland. The crude death rates for the European countries, except for the Scandinavian countries, are generally higher than those for the other parts of the world.

Scandinavian countries. The trends of the crude death rates for Sweden, Denmark, Norway and the Netherlands during the decade prior to the war were generally downward, and form an undulating pattern. With the possible

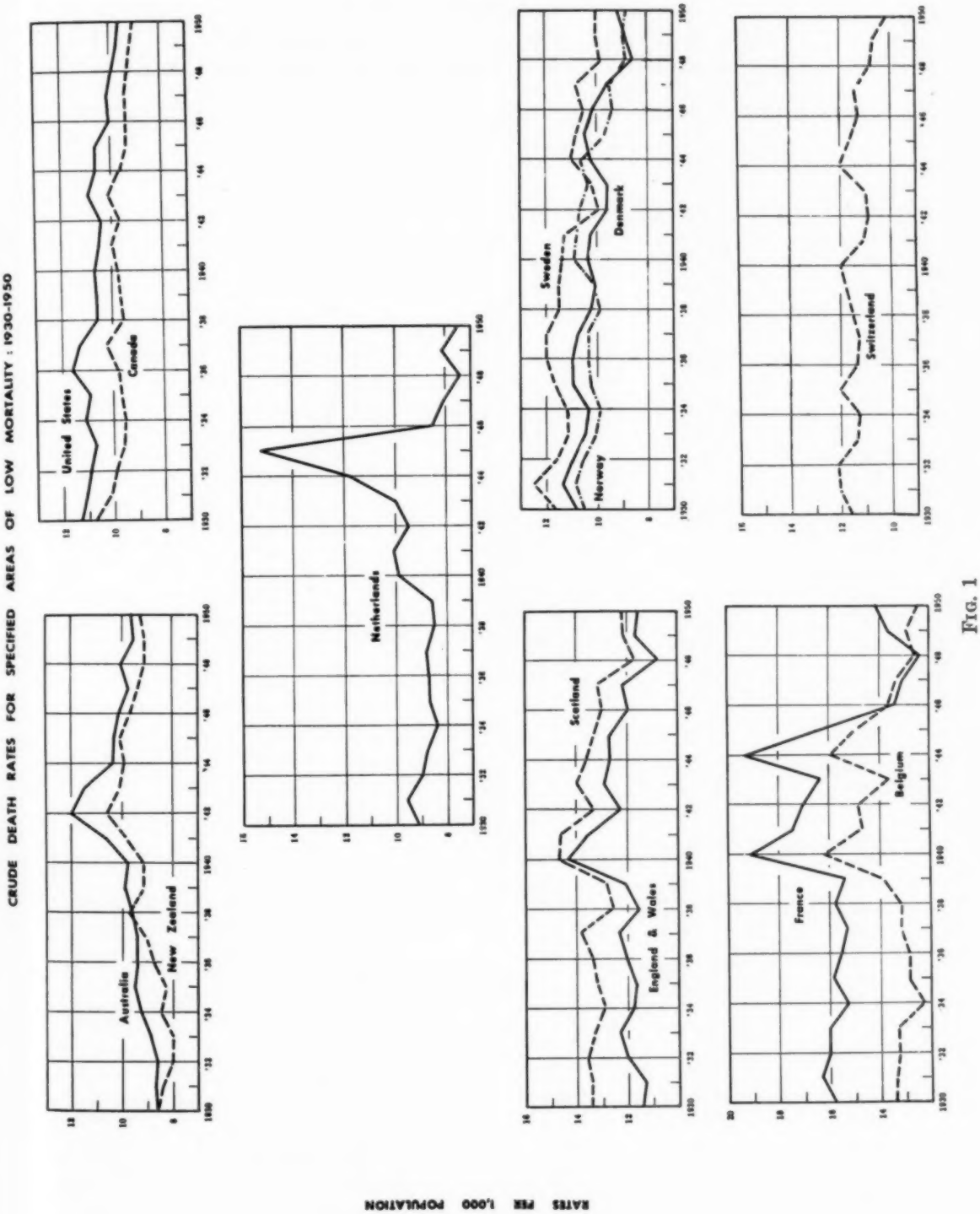
CRUDE DEATH RATES FOR SPECIFIED AREAS OF LOW MORTALITY : 1930-1950
RATES PER 1,000 POPULATION
United States
Canada
Australia
New Zealand
Netherlands
Sweden
Norway
Denmark
Switzerland
Scotland
England & Wales
France
Belgium

FIG. 1

TABLE 1

Death Rates by Age: 15 Selected Countries, for Specified Years

(Exclusive of fetal deaths. Rates per 1,000 population in each specified group.)

AREA AND YEAR	All ages	Under 1 year	1–4 years	5–14 years	15–24 years	25–44 years	45–64 years	65 and over
North America								
Canada:[1]								
1950	9.0	11.2		0.8	1.2	2.2	10.9	61.4
1947	9.4	48.9	2.5	0.9	1.6	2.6	11.5	62.5
1938	9.5	18.3		1.6	2.1	3.4	11.3	65.8
1931	10.1	24.0		1.7	2.8	4.2	11.9	64.1
United States:								
1950[2]	9.6	33.0	1.4	0.6	1.3	2.6	13.1	62.3
1947[2]	10.1	34.5	1.6	0.7	1.6	3.0	14.1	63.7
1938	10.6	58.0	3.8	1.2	2.3	4.4	15.4	69.8
1930	11.3	69.0	5.6	1.7	3.3	5.7	16.8	73.7
Europe								
Belgium:[3]								
1950	12.5	55.8	1.9	0.6	1.3	2.7	11.9	67.9
1947	13.2	72.9	2.9	1.0	2.1	3.7	12.8	67.0
1938	13.4	89.3	5.8	1.7	2.7	4.4	14.2	69.9
1930	13.4	106.8	8.3	2.1	3.7	5.0	14.5	70.9
Denmark:[4]								
1950	9.2	7.0		0.5	0.8	1.8	9.1	63.9
1947	9.7	39.9	1.8	0.6	1.2	2.4	10.0	65.6
1935	11.0	19.3		1.3	2.0	3.3	11.9	74.7
1930	10.8	20.1		1.2	2.5	3.6	11.8	70.0
England and Wales:								
1950[5]	11.6	29.8	1.4	0.6	1.1	2.1	11.2	69.1
1947[2]	12.0	12.1		0.8	1.5	2.6	11.8	68.2
1938	11.6	55.1	4.6	1.5	2.2	3.3	13.1	69.0
1930[6]	11.4	64.6	7.0	1.9	2.7	4.1	13.7	67.9
France:[7]								
1950	12.6	48.7	2.3	0.6	1.3	2.9	11.3	65.2
1946	13.6	90.5	4.4	1.2	2.3	3.8	11.7	69.4
1938	15.7	17.7		1.5	3.2	5.8	16.7	80.7
1931	16.5	75.8	6.7	2.1	4.2	6.2	16.8	86.9
Netherlands:								
1950	7.4	25.7	1.6	0.5	0.8	1.5	7.9	57.9
1947	8.0	34.4	2.3	0.8	1.5	2.1	8.6	57.0
1938	8.5	37.6	3.2	1.0	1.5	2.5	10.3	65.3
1930	9.0	53.2	5.2	1.4	2.1	3.1	11.0	64.8
Norway:								
1950	9.1	6.7		0.7	1.1	1.7	7.5	61.9
1947	9.5	9.4		0.8	1.7	2.4	7.9	61.3
1938	10.0	10.4		1.0	2.3	3.7	9.8	66.4
1930	10.5	12.0		1.6	3.8	5.1	10.7	63.4
Scotland:								
1950[5]	12.4	39.0	1.8	0.6	1.5	2.9	13.2	74.8
1947[2]	12.9	56.7	2.9	1.1	2.2	3.4	13.4	72.2
1938	12.6	73.9	6.6	1.6	2.5	3.9	14.9	74.8
1930[8]	13.3	91.2	10.2	2.2	2.9	4.9	15.6	75.8

TABLE 1—*Continued*

AREA AND YEAR	All ages	Under 1 year	1–4 years	5–14 years	15–24 years	25–44 years	45–64 years	65 and over
Sweden:								
1950	10.0	21.4	1.3	0.5	1.0	1.8	8.8	65.8
1947	10.8	25.9	1.5	0.7	1.5	2.4	9.5	70.2
1938	11.5	44.0	3.0	1.2	2.6	3.5	11.2	71.7
1930	11.7	57.2	3.9	1.7	3.5	4.5	11.6	67.5
Switzerland:								
1950	10.0	32.4	1.9	0.6	1.1	2.2	10.4	62.7
1947	11.4	40.0	2.5	1.1	1.9	2.8	11.6	71.7
1941	11.1	46.4	3.0	1.2	2.2	3.2	13.0	68.4
1930	11.5	14.5		1.6	3.1	4.4	15.6	73.5
Oceania								
Australia:[9]								
1950	9.6	25.0	1.6	0.7	1.3	2.1	11.7	67.5
1947	9.7	28.4	1.8	0.7	1.2	2.4	12.0	66.7
1938	9.6	39.2	3.4	1.2	1.9	3.2	12.2	67.3
1933	8.9	10.8		1.2	1.8	3.5	12.2	63.9
New Zealand:[10]								
1950	9.3	23.3	1.2	0.5	1.1	1.8	10.5	61.4
1947	9.4	7.6		0.5	1.2	2.0	11.0	60.4
1938	9.7	10.8		1.4	1.9	3.3	12.0	67.3
1933	8.0	8.0		1.0	1.7	3.0	10.7	64.3

[1] Excluding Yukon and Northwest Territories and, prior to 1950, excluding Newfoundland also.

[2] Excluding deaths among armed forces outside country. Rates based on population excluding armed forces outside country.

[3] Including deaths among armed forces.

[4] Excluding Faroe Islands.

[5] Excluding deaths among armed forces outside country. Rates based on population including armed forces outside country.

[6] Rates based on population enumerated as of April 26/27, 1931.

[7] Excluding deaths of live-born infants dying within three days after birth without being registered as live births.

[8] Rates based on population enumerated as of April 26, 1931.

[9] Excluding deaths of full-blooded aborigines.

[10] Excluding deaths among Maoris.

Source: Rates were computed by the National Office of Vital Statistics. Basic data were from the Demographic Yearbooks of the United Nations or from the official statistical yearbooks of the individual countries.

exception of Sweden, there was increased mortality in the Scandinavian countries during the war years. The Netherlands, in particular, suffered high mortality all through the war. The peak was reached in 1945, and the crude death rate recorded for that year was about 75 per cent higher than the prewar rate. However, the crude death rates for all of these countries appear now to be in line with their prewar trends.

The age-specific mortality rates show a fairly consistent pattern. During the prewar years, death rates were declining for every age group, except 65 years and over, in the Netherlands, Norway and Sweden. In Denmark, increased mor-

tality was recorded for persons aged 5–14 years and 45–64 years, in addition to the age group 65 years and over. In the postwar period, drops in rates were recorded for every age group in Denmark and Sweden; and in the Netherlands and Norway, decreases were reported for every age group except those 65 years and over. The average annual decrements in the death rates at younger ages were relatively large.

As compared with data for 1930, the death rates for 1950 were lower in every age group. The drop in mortality was most conspicuous in the younger age groups.

England and Wales, and Scotland. The rising trend in mortality for England and Wales is fairly evident in the prewar years. In Scotland, the crude death rate is higher than that of England and Wales but the trend in not as clear. However, there appears to be a tendency for the crude death rates for Scotland to parallel those of England and Wales.

The wartime peak occurred in 1940 in both Scotland, and England and Wales, after which the crude death rates declined rapidly in 1941 and 1943. Since 1943, the decline has been more gradual but fairly regular. A sudden drop in mortality in 1948 brought the crude death rates to the lowest levels ever recorded in England and Wales, and in Scotland. Although the rates returned to higher levels in 1949 and 1950, the crude death rates for these years were much lower than those for the prewar years.

Unlike the general death rates, the age-specific death rates for both Scotland, and England and Wales have been declining for every age except the older groups. The average annual increase in the death rates for the population 65 years and over is relatively small. The rate of decrease in the death rates for the age group 45–64 years is considerably smaller than that for the younger ages. The average annual decrement in the age-specific death rates is greater in the postwar than in the prewar years.

Other European countries. The prewar trend of the crude death rates for France, Belgium and Switzerland was generally downward. There is considerable similarity in the pattern of crude death rates for France and Belgium in the prewar and war periods.

The excess mortality in France and Belgium during the war was considerable. The two major peaks of almost equal magnitude occurred, first in 1940 and second in 1944. The decline in mortality was rapid after the war. This was true particularly in France, and the large differential that existed in the crude death rates between Belgium and France in prior years was closed. The crude death rate for France dropped below that for Belgium between 1946 and 1948, but in in 1949 and 1950 the rate for France again exceeded that for Belgium. However, the rates for these years were not out of line from what the rates would have been had the prewar trend continued. The crude death rates for Switzerland do not indicate any unusual change in mortality during the war period, but there has been an acceleration in the decline of mortality in the postwar years.

Before the war, the age-specific death rates were decreasing in every age group in France, Belgium and Switzerland. In the postwar period, the decline continued at an accelerated pace.

Oceania

By the early 1930's, the crude death rates for Australia and New Zealand had declined to their lowest levels, and Oceania was the area of lowest mortality as compared with the rest of the world. However, in the same decade, the crude death rates took a definite upward turn. During World War II, both Australia and New Zealand experienced a marked increase in mortality. Since mortality statistics for Australia include deaths of the military outside the country, the wartime rise is explainable. On the other hand, the statistics for New Zealand do not include deaths of the armed forces outside the country. Hence, the reason for the wartime peak in 1942 is not as clear, unless it represents the effects of the movement of able-bodied men for military service out of the country.

The postwar decline in mortality has brought the crude death rates to their prewar levels. However, there is a hint of a resumption of the upward trend in the crude death rates which was evident in the prewar years.

The rising trend of the crude death rates in the prewar years is partially explained by the increase in mortality by age. In the period 1933 through 1938, the only age group in Australia that recorded a decline in the rate was 25–44 years. In the postwar years, there was a substantial drop in the death rates for some segments of the population, namely, infants, preschoolchildren, and the 25–44 year age group. On the other hand, a relatively large increase was reported for the 15–24 year age group, and a smaller rise for the age group 65 years and over. For the period 1933 through 1950, the age-specific death rates for the various age groups in 1950 were considerably lower than those for the corresponding ages in 1933, except for persons 45 years and over.

The mortality experience for New Zealand is marked by relatively large increments in rates for every age group between the years 1933 and 1938—the period of greatest increase in mortality in New Zealand. The increases were particularly large in the younger ages. In the postwar years, the rates dropped for every age group except for children of school age (5–14 years) and for the old age group. Although the crude death rate for 1950 was higher than that recorded for 1933, the age-specific death rates for 1950 were lower than those for 1933.

DEATH RATES BY AGE

A comparison of the age-specific death rates in 1950 for the United States and for the other countries shows that the levels of mortality in New Zealand were lower, age group by age group, than those for the United States. The death rates for the United States by age were generally favorable relative to those of Denmark, Sweden, Norway, the Netherlands, Switzerland, and England and Wales. The death rates for Canada, although higher than the rates for the United States in the childhood ages, were lower in the age groups 15 years and over.

The prospects for further extension in life expectancy are good for countries with relatively high mortality in the younger ages. On the other hand, substantial increases in life expectancy at birth cannot be as readily achieved in the areas where the age-specific death rates are already low, unless some unusual means are found to reduce mortality in the older ages. Therefore, the death rates in the older ages are of more than casual interest.

TABLE 2

Death Rates for Ages 65 years and Over, and Ratio of U. S. Death Rate to the Corresponding Rates for Specified Countries, in the year 1950

	Death Rate per 1,000 Population					Ratio of U. S. Rate to Rate for Country				
	65–69 yrs.	70–74 yrs.	75–79 yrs.	80–84 yrs.	85 yrs. & over	65–69 yrs.	70–74 yrs.	75–79 yrs.	80–84 yrs.	85 yrs. & over
United States	33.8	51.5	78.9	120.9	202.0	1.00	1.00	1.00	1.00	1.00
Norway	23.5	38.8	71.1	163.4		0.70	0.75	0.91	—	—
New Zealand	31.6	48.7	—	117.2	—	0.94	0.95	—	—	—
Canada	31.7	48.9	77.3	123.4	214.7	0.94	0.95	0.98	1.02	1.06
Netherlands	26.7	45.2	77.5	129.6	226.8	0.79	0.88	0.98	1.07	1.12
Denmark	28.2	48.9	84.0	140.0	261.3	0.83	0.95	1.07	1.16	1.29
France	30.4	49.4	81.1	131.5	225.4	0.90	0.96	1.03	1.09	1.12
Sweden	27.8	47.8	82.1	141.6	248.1	0.82	0.93	1.04	1.17	1.23
Australia	33.0	53.8	83.5	139.4	244.8	0.98	1.05	1.06	1.15	1.21
Switzerland	31.8	52.6	86.1	141.2	235.7	0.94	1.02	1.09	1.17	1.17
England & Wales	33.6	54.3	89.8	141.8	227.6	.99	1.05	1.14	1.17	1.13
Belgium	33.8	53.9	88.6	143.8	226.9	1.00	1.05	1.12	1.19	1.12
Scotland	37.5	63.1	93.8	143.3	227.2	1.11	1.23	1.19	1.19	1.13

In 1950, the death rate for the population aged 45–64 years in the United States was higher than the rate for the corresponding age group of any other country, except Scotland. The differences in mortality were considerable. The death rate for persons aged 45–64 in New Zealand, for example, was only 57 per cent of the rate for the corresponding age group in the United States. The rates for the Scandinavian countries ranged from 60 to 70 per cent of the rate for the United States.

In the older age groups (Table 2), the comparison is more favorable to the United States. However, there are three countries—Canada, Norway and New Zealand—that experienced consistently lower mortality rates in the older age groups as compared with the United States. In general, the death rates in the United States were high compared with the corresponding rates for the other countries in the lower range of the age-scale 65 years and over, but the position of the United States steadily improved in the older age groups[2].

SUMMARY

The crude death rate for the United States has dropped to a low level in recent years. Although the death rate (9.2 per 1,000 population) for 1954 was the lowest recorded in the history of the country, several other countries showed death rates equal to, if not more favorable than, that for the United States.

Although there is a large differential in the levels of mortality even among the areas of lowest rates, several patterns of mortality trends are observed. Each of these patterns appears to be generally uniform geographically.

[2] Ratios over 1.00 indicate that the death rate for the country was higher than the corresponding rate for the United States; ratios below 1.00 signify that the rate for the country was lower than that for the United States.

Prior to World War II, the trend of the crude death rates for most of the countries was downward or stationary. Exceptions were England and Wales, Australia, and New Zealand, where there was a reversal of the downward trend. Virtually all of the countries experienced increased mortality during World War II. However, in almost every instance, the rapid postwar decline has brought the crude death rates back in line with the prewar trend.

Significant improvements in mortality rates have been made in every country of low mortality over the past twenty years, particularly for the younger ages. In most countries, the decline in mortality has not been especially large for the age groups over 45 years.

The prospects of further declines in mortality are good, especially in several European countries where the death rates at the younger ages are still relatively high. On the other hand, substantial increases in life expectancy at birth cannot be expected in most of the other areas where the age-specific rates are already low, unless death rates in the older age groups can be reduced.

In general, the lowest age-specific death rates are found in the Scandinavian countries and in New Zealand. If the death rates already attained in these countries are any indication of what might be achieved in the United States, further reductions in mortality rates are possible. The death rates for the age groups 45 to 74 years are still high in the United States as compared with the rates for other countries. It is only in the very oldest and in the younger age groups that the mortality rates rank favorably.

BASIC NEEDS OF A SELECTED GROUP OF WIDOWS AS REVEALED THROUGH PROJECTIVE QUESTIONS

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This investigation is part of a larger study of the personal adjustment of a selected group of widows of 55 years of age or older.

SAMPLE

The present study included 76 middle-class and upper middle-class widows living in two college communities which were similar in population and other respects. Their mean age was 68 years. About half the subjects were drawn consecutively from several church registers, and the other half were suggested by informants in the communities who were encouraged to list every person they knew who was a widow with at least a high school education and who was unemployed or employed only part of the time. Initially, 104 women were selected, and, of these, 76 (73 per cent) agreed to cooperate. Most of the women possessed either excellent or good adjustment according to the Burgess, Cavan, Havighurst Inventory (1).

METHOD

The two types of projective questions used were stated as follows:

If you could have three wishes, what would they be?

Thinking of a woman in her middle and later years, to what kinds of things does she have to adjust? What helps most in her adjustment to everyday life?

This type of question often proves to be useful because it enables the individual to talk or write about himself and his innermost desires without complete awareness of what is being revealed and therefore with less defensive-concealment than might be found if the question were phrased more directly. The first question contains an element of projectivity in that it offers the subject freedom to choose from a large number of possible responses, any of which would be equally appropriate. In the second question the person may avoid all personal references by talking about people in general.

The first question was posed in an interview in which the Burgess, Cavan, Havighurst Questionnaire was used as an interview guide. The second question was included in a letter sent out to the entire sample of 76 cases. Letters were also sent to 16 subjects who refused to be interviewed, in order to obtain clues concerning their adjustment.

Projective questions were sent by mail for several reasons. Most important, perhaps, was the desire to make use of the time spent in developing rapport with members of the group. Some of the interviews were conducted during two or three visits and were of many hours' duration. It was felt that the relationship developed during these interviews might stimulate members of the group

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to record whatever thoughts had come to mind during the time which had elapsed since termination of interviewing. In some cases there may have been motivation toward frankness, in that this was the last opportunity for communication with the interviewer. Bossard and Sanger (2) state another reason for the use of such a technique. They have observed that individuals differ markedly in their ability to verbalize in conversation, particularly about intimate aspects of their lives. Some people appear to express themselves more freely on paper, whereas others communicate more freely by talking.

Responses to both projective questions were classified according to lists of basic needs drawn up by Thomas (3) and Geisel (4). If there was duplication in the lists, one of the categories of needs was eliminated. In two instances, clearer expression of the needs was obtained by combining statements of the two authors.

RESULTS

Results are summarized under the various headings of the classification of needs which was employed. The percentage of the 76 women sampled who expressed a specific wish is given first, followed by the number of women expressing this wish and the percentage mentioning the wish first. Typical examples of the manner in which wishes were expressed are cited, in order to illustrate the basis for the classification employed and to describe the thought processes of the subjects.

Interviews

Responses to projective question: "If you could have three wishes, what would they be?"

Need for Physical Health and Comfort

Percentage of total: 43. Number = 32. Percentage listing first: 24.

Typical comments: Take care of myself and not be a burden until I die. Good health—you are licked if your health is gone. Good health—as long as I stay sound of mind and vision.

Need to be Useful: The Desire for Recognition

Percentage of total: 28. Number = 21. Percentage listing first: 10.

Typical comments: How I wish that I could find some way of being of use to others! Be able to help others as long as I live and fulfill my purpose. Be able to work so I can maintain myself and not have to be dependent.

Need to Believe in Something Lasting

Percentage of total: 20. Number = 15. Percentage listing first: 13.

Typical comments: Fourteen of the fifteen wishes expressed a desire for world peace, often in a religious context.

Need to Love and Be Loved

Percentage of total: 18. Number = 13. Percentage listing first: 12.

Typical comments: That my husband and I could live through old age together. That I might have somebody with me who would enjoy my home as I

do; children could be closer together so I could see them oftener. That I could have everybody back.

Need for Emotional Security and Freedom from Anxiety and Worry

Percentage of total: 16. Number = 12. Percentage listing first: 4.

Typical comments: Income sufficient to last; to be able to keep my home; continue present health, leisure and means for present way of life.

Need to Express or Achieve Some Interest

Percentage of total: 11. Number = 8. Percentage listing first: 0.

Typical comments: Have a nice farm with some cattle like the old days; be able to travel and see many interesting things.

Miscellaneous

Happiness: percentage of total = 10.

Personal development: percentage of total = 4.

Most of the women who make wishes about health do not indicate dissatisfaction with their present state of health; their chief concern seems to be that they will lose their health and become dependent. The desire for independence is also expressed in "The Need to be Useful," by those who said that they hoped that they could maintain themselves and never have to be dependent upon anybody. Concern over loss of independence is also expressed in the "Need for Emotional Security."

The desire for peace seemed to be an expression of a desire for something lasting, especially since it was so frequently expressed in a religious context with the hope that spiritual values, of the kind which would bring lasting peace, might prevail.

Twenty-seven per cent of the group expressed no wishes; 18 per cent, one wish; 15 per cent, two wishes; and 40 per cent three wishes.

Some of the best adjusted women appeared to be somewhat resistant to the request for expression of wishes. This seemed to suggest that well adjusted women may think in terms of realistic manipulation of their environment rather than wishing about it. Nevertheless there was no statistically significant difference between the total adjustment scores of those who mentioned three wishes compared to the scores of those who expressed no wishes.

Thirteen women expressed only altruistic wishes which had no reference to personal gain, whereas 12 women selected wishes which were more self-centered. When the total adjustment scores of the groups who selected wishes at the opposite extremes of altruism and self-centeredness were compared, it was found that those whose wishes were altruistic had higher adjustment scores than those whose wishes were centered in self. This difference was found to be significant at the 5 per cent level ($t = 2.59$, $P < .05$).

Letters

As stated previously, projective questions were also posed by means of letters sent to the entire sample of 76 cases. The questions were as follows: "Thinking

of a woman in her middle or later years of life, to what kinds of things does she have to adjust? What helps her most in her adjustment to everyday life?"

Of the 85 letters sent out, 46 were finally returned. A follow-up letter sent to those who did not respond to the original request proved of considerable value, since it increased the number of responses by one third. The low incidence of response underlines what Landis (5) has said about questionnaire studies of the aged: "Old people will sit by the hour, giving information concerning themselves without expending the nervous energy that would be required to labor through even a very simple questionnaire."

The number of words in the responses varied from 20 to more than 800. Most of the letters were about 100 words in length. Responses are summarized under the categories of needs, as follows:

Responses to Projective Question: "To what kinds of things does a widow have to adjust?"

Need to Love and be Loved

Percentage of total: 78. Number = 35. Percentage listing first: 58.

Percentage related specifically to loss of husband: 17. Percentage related specifically to absence of children: 24. Percentage related specifically to changes in social life through loss of husband: 9.

Typical comments: It is very hard to adjust to life outside the family circle and the lonesomeness it brings. It is hard to accept the sudden realization that one's children are grown and independent and no longer need extensive watchful care. I find it hard to live on my own reserves and not cling too much to my family—my children have their own lives to live, which are fuller than ours as we get older—one should be cheerful and happy so as not to cramp their style and then they will want to have you near them. I have lost so many of my own-age friends—the real thing is to find other friends and to be truly wanted. You have a feeling of not being wanted after your partner has gone—you just don't fit in—you are always the third person and you yearn for companionship with an understanding person. Evenings are the worst—your friends with husbands go out and you are left alone with thought of the good times you used to have and how alone you are now. You have to adjust to the lack of the devotion you once had—someone vitally interested in your welfare. The first thing you need to do when you are alone in the middle or later years is to make a decision to overcome the loneliness which comes after so many years of married life with children who have all gone away.

Need for Emotional Security and Freedom from Anxiety and Worry

Percentage of total: 20. Number = 9. Percentage listing first: 13.

Typical comments: It's hard to adjust to the worry that I might have to become dependent in another's home. Income is the greatest problem—I have to adjust to limited means and worry over my investments. I worried about having to sell my house and live with relatives with their different way of life.

Need for Physical Health and Comfort

Percentage of total: 20. Number = 9. Percentage listing first: 6.

I don't have the strength to do the things I did in younger life and I have to try to get used to it. One's general physical condition has much to do with the things one has to adjust to. Too much activity brings on excessive fatigue and this brings on mental strain.

Need to Achieve or Express Some Interest

Percentage of total: 8. Number = 3. Percentage listing first: 0.

Typical comments: You have to adjust to having nothing to look forward to—all through life there is something just ahead but in old age there is only death. I have to find something to take the place of important work and activities I used to have.

Need for Personal Development

Percentage of total: 8. Number = 3. Percentage listing first: 0.

Typical comments: When you are left alone you need to adjust yourself to the need to live and decide your own future. The lack of deadlines and routines is debilitating—as the man accumulates more money the woman gets less and less to do.

Need for Recognition

Percentage of total: 8. Number = 3. Percentage listing first: 0.

Typical comments: I have to adjust to being my age. It is hard to step aside for younger women in church work and jobs. I feel better qualified than at any time in my life but they only want younger people; an older woman has little time to look ahead to the time when she must step down and let younger ones carry on.

The three comments just cited are not at all typical of women in the group. Only about 5 women of the total group seemed to take an active approach to aging in which the economic or social roles of younger women were earnestly desired.

Five respondents said that they had no special adjustment problems. Most of the women, however, recognized that adjustment problems did exist for them; few spoke with enthusiasm about successes in finding solutions to their problems.

Responses to Projective Question: "What helps most in adjustment to everyday life?"

1. Faith in God—19.
2. Associations with the church—10.
3. Keeping busy—9.
4. Interest in many things—8.
5. Reading—7.
6. Having a hobby—7.
7. Doing things for somebody else—6.
8. Having a large circle of friends—5.

9. Having a job—5.
10. Having your own home in preference to living with others—4.
11. Club meetings—3.
12. Gardening—3.
13. Adjust to living on your own reserves—2.
14. Eight other items listed singly.

It may readily be seen that religion is considered to be the most important factor which contributes to adjustment. This is consistent with the fact that church activities account for the greatest part of the organizational life of these women.

Little attention need be given to a summary of the statements describing the factors considered to be conducive to adjustment. Few of the responses suggested that the respondents had given much thought to the development of a philosophy for the later years.

The superficiality of many of the written responses, compared to revelations obtained in interviews, suggests that many of the subjects found it difficult or unrewarding to express their philosophy in writing. These responses represent only about 50 per cent of the total group, but the widows who answered the letter might be expected to be the ones who felt that they could respond to the question most adequately.

DISCUSSION

The differences between the responses to the question described in the first part of the present study and the questions sent by mail seem significant. When subjects were asked to project their thoughts into the future through wishes, they were mainly concerned about health difficulties which would make them dependent. When asked to state the things to which women have to adjust in the present, difficulties with health seem to be relatively unimportant. The need to love and be loved then become much more important than any of the other needs mentioned. Over three-quarters of the group expressed this need, and over half of them listed it first. The need next in order of incidence was mentioned by only one fifth of the group. Spontaneous comments seemed to indicate that the concern over health mentioned in connection with the first question was related to family relationships, in that many of the women felt that they would be a burden to their children if their health failed.

Projective devices are noted for their ability to draw out underlying feelings. For this reason it is especially interesting to note that the needs mentioned most frequently in response to both projective questions seem to be related in terms of the underlying anxiety which is expressed. Responses to the "three wishes" question express anxiety over loss of health which involves dependency upon others and possible loss of the kind of spontaneous affectional relationship which is a part of equal-status relationships. The need for satisfactory interpersonal relationships is also mentioned first in responses to the second projective question ("To what things does a woman in her middle and later years have to adjust") in that most of the women express the need to love and be loved.

The frequency with which expressions of need for love and affection appear call to mind Horney's (6) belief that love is overvalued in our culture:

> ". . . . there is provoked, in the normal individual of our time, an intensified need for affection as a remedy. Obtaining affection makes him feel less isolated, less threatened by hostility and less uncertain of himself. Because it corresponds to a vital need, love is overvalued in our culture. It becomes a phantom-like success—carrying with it the illusion that it is a solution for all problems."

Without underestimating the importance of the need for love, it appears that other needs might well receive more emphasis: development of appropriate social activities and recreational outlets; finding new interests and useful work; and dealing realistically with health problems, economic difficulties and other sources of anxiety and worry. All but 3 of the women had a considerable amount of free time and yet only 17 women had part-time work, and 4 women were employed full time. Undoubtedly suitable work is hard to find and some are unable to work for health reasons, but this is not so true of leisure-time pursuits. Twenty-eight women have no hobbies or favorite pastimes and 17 listed only one. Most of the women listing hobbies selected one from a list preceding the item in the questionnaire. Very few women listed any special hobby which stemmed from a particular interest which would require originality and initiative in its conception and pursuit. Only 54 women stated that there were things they planned to do in the next year or two, and many did not speak of their plans with much enthusiasm. Then, too, only 3 women expressed a need for personal development.

These findings seem important in the light of the present-day mental hygiene emphasis upon meeting needs in context, so that no one area of life is overemphasized. The basic needs have been called "basic" because they are not reciprocal. Bettelheim (7) has stated this succinctly: "love is not enough." Indeed, without meaning to be disrespectful toward those who richly deserve admiration, it might be said that emphasis upon other needs has a favorable influence upon a correlate of the need for love, lovableness.

SUMMARY

Responses to two projective questions, one posed in an interview and the other in a letter, were placed in categories representing various basic needs. These categories, listed in order of magnitude according to the number of wishes included under them, were as follows: Physical Health and Comfort; Need to be Useful; Desire for Recognition; Need to Believe in Something Lasting; Need to Love and be Loved.

Most of the women who made wishes about health did not indicate dissatisfaction with their present state of health. Their chief concern seemed to be that that they would lose their health and become dependent.

The adjustment scores of the women who expressed altruistic wishes were higher than the scores of those who expressed wishes centered upon themselves. This difference was statistically significant.

Written responses to a projective question asking about factors necessitating adjustment were also classified as follows, listed according to category size: Need to Love and be Loved, Need for Emotional Security and Freedom from Anxiety and Worry, Need for Physical Health and Comfort.

Needs mentioned most frequently in response to both projective questions seemed to be related in terms of the underlying anxiety which was expressed—the need for satisfying interpersonal relationships.

It is suggested that the emphasis given to love reflects insufficient consideration of other needs.

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TREATMENT OF PRIMARY HYPERTENSION IN THE OLDER AGE GROUP

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The simplest and more popular of the classifications of hypertension today is the division into primary and secondary types (1). The latter implies some existing predisposing cause. It is the former variety, the primary, with which we shall concern ourselves here. The term primary implies the essential type in which the etiology, pathogenesis, and clinical course are in doubt, and in which the treatment is generally unsatisfactory.

It has been estimated that about 80 per cent of hypertensive patients fall into the primary group (2). When it is stated that as high as 15 million persons in the United States are suffering from hypertension (3), it can readily be seen that we are dealing with a common malady. Both the actual numbers and relative percentage of such patients are higher in a geriatric practice.

Although no specific figures exist, it has been generally conceded that a systolic pressure of over 140 mm. of mercury and a diastolic pressure of over 95 mm. permits classification as hypertension. Recently Master *et al.* (4) found an increasing incidence of diastolic pressures over 95 mm. in the older age group. This should influence the management of such cases.

From the prognostic and therapeutic points of view, the older the hypertensive subject, the more favorable is the picture. Murphy (4) expressed the opinion that in individuals over the age of 60 years, hypertension usually is a benign disease which presents few of the serious complications.

Sex, too, seems to exert an influence on the prognosis. The female sex, in keeping with its reputation of being the biologically stronger, again demonstrates its strength. There is a more favorable prognosis in the female sex.

The importance of hypertension lies mainly in its sequelae. The sudden change from the benign to the malignant phase, retinopathy, encephalopathy, cardiac, cerebral and renal complications, and the occasional dissecting aneurysm, are each of a serious nature and may lead to disability or premature death. The older the hypertensive patient, the less apt are these sequelae to occur.

TREATMENT

The handling of primary hypertension in the older age group (arbitrarily considered as persons over 65 years of age) requires as much of the art as of the science of medicine. Conservative therapy is indicated, particularly in those patients who present no symptoms referable to their hypertension and who are known to have had high blood pressure for a long period of time. By conservative therapy is meant advice concerning living habits, and the use of psychotherapy, diet and mild innocuous medications. For the more severe case with troublesome

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symptoms and complications, the use of the more potent medical agents may be required.

Living habits and psychotherapy

The importance of this phase of treatment should not be underemphasized.

a. *Ability to work.* The older patient, as a rule, does not present the problem of ability to work, as does the younger patient. By the time the age of 65 years is reached or exceeded, the economic status of the individual is usually determined, whether it be pension, social security, insurance annuities, accumulated wealth, dependence on social agencies, children, or relatives, or (more unusual at this age) dependence upon a job or independent business or farm. The problem of the ability to work enters only when the individual is still actively employed. To prohibit these people from work is poor policy. If their physical status is such that they feel well enough to continue, they should be permitted to do so. Asymptomatic hypertension, per se, is no indication to advise retirement. It may be necessary to advise some modifications in routine—possibly shorter hours or fewer workdays each week—but if the work offers no problem of undue physical or mental stress, it is good treatment to permit the patient to continue.

b. *Rest.* Depending upon the situation and the degree of hypertension, rest should be prescribed in the "doses" indicated by the individual case.

c. *Tobacco.* The old person who is a confirmed smoker for many years will, in all probability, continue to smoke, regardless of what he is told. Stewart, Haskell and Brown (5) have shown that smoking promotes decreased peripheral blood flow, increased heart rate, and increased blood pressure in the older patient with vascular disease. It is our duty, whether the patient obeys or not, to advise that he or she stop smoking, or reduce it to a minimum.

d. *Alcohol.* Diversity of opinion exists in this regard. Many authorities, including White (6), permit its use in moderation. When not used to excess, it may even have a favorable effect.

e. *Recreation and hobbies.* These should be encouraged. When not gainfully occupied, the older individual with an abundance of time tends to concentrate on his health; thus many symptoms appear, real or imagined, and these are usually exaggerated. It should be emphasized that a chosen hobby or recreation should be carried out in a leisurely fashion and not be entered into with a feeling of keen competition or resulting excitement.

f. *Psychotherapy.* This phase of treatment is commonly neglected. It is time-consuming to administer, but should at least consist of a word of reassurance. Little emphasis should be placed on single blood pressure readings, because undue alarm may be incited in some patients by noting the slightest rise in blood pressure over the previous reading. It is far better to abstain from quoting actual figures, if possible; if compelled to do so, it is good psychotherapy to minimize their significance. Encouragement is the best form of psychotherapy.

Diet

Diet plays an important role in the treatment of hypertension. Generally, there is a lack of cooperation on the part of the patient in following one of the

accepted schedules. Unfortunately, the prescribed diet is either distasteful, inconvenient to prepare, or not in keeping with the accustomed foods which have been eaten for many years. Likes and dislikes are usually firmly established in the older individual.

Generally, two types of diet are prescribed for the hypertensive patient.

1. *The low-calorie diet.* This is regulated according to the weight of the patient and, when indicated, is of paramount importance. White (6) states, "The reduction of weight and the reduction of blood pressure, in obese hypertensive patients, often go hand in hand." Physical inactivity on the part of the elderly makes it even more important that their caloric intake be limited. Vitamin and mineral supplement should be provided.

2. *Restrictive diets.* These consist of a low-sodium or a low-protein diet, or a combination of both. The low-salt diet is the most widely accepted, and should provide a sodium intake of about 200 mg. daily. Kert *et al.* (7) have outlined such a diet. The patient is often reluctant, and it is unusual to find one willing to continue for any prolonged period of time. Return to old habits is common, and the concession is made to follow a modified low-salt regimen. This consists of saltless cooking, no table salting of food, eating no obviously salted foods, and possibly using salt-free bread and milk. The sodium content of such a diet usually exceeds 500 mg.; thus, although it may be satisfactory for cases of mild hypertension, it is of little therapeutic value in the more severe cases.

The low-protein diet is not widely accepted, nor has it been publicized. Its major indication is hypertension with impaired renal function and nitrogen retention. Actually, with the increased catabolism and negative nitrogen balance in the older age group, proteins are indicated.

The rice diet, originated by Kempner (8) is low in both salt and protein. It consists of rice, fruit, sugar, and fruit juices, supplemented by vitamins and iron, and provides about 20 Gm. of protein, 5 Gm. of fat, 460 Gm. of carbohydrate, 0.2 Gm. of sodium, and 0.15 Gm. of chlorides. It is the rare patient who will adhere to such a diet for any length of time.

The cation exchange resins have been used to enhance the excretion of ingested sodium. These, however, are distasteful and frequently have an unpleasant effect on the bowel. Again there is reluctance on the part of the patient, and the medication is discontinued after a short period of time.

Drugs

Impressive is the number of medications which have been and are now being used for the treatment of high blood pressure. Many which have enjoyed popularity in the past, such as garlic, barley extracts, vitamins (particularly vitamin E), androgens and estrogens, have been found to be valueless and are not recommended. Some of the newer drugs are of value but, unfortunately, present an element of danger in their use. The patient must be chosen with care and the physician well versed in the method of administration of some of these newer agents.

1. *Sedatives.* This group of drugs has stood the test of time. The barbiturates,

bromides and chloral hydrate are those most frequently used. The barbiturates have the unhappy side effect, particularly in the aged individual, of causing mental confusion and depression when used for long periods of time. The bromides must be used cautiously because of the danger of bromidism. A combination of bromide and chloral hydrate is effective and best alternated with barbiturates. The sedative group should be used for relatively short periods of time, only to tide the patient over emotional rough spots.

2. *Iodides.* Potassium iodide has long been used and recognized as an agent of value in the treatment of hypertension and arteriosclerosis. It is still useful and, as pointed out by Clendening and Hashinger (9), should be employed in relatively small doses over long periods of time. It should be discontinued at the first sign of iodism.

3. *Xanthines.* Aminophylline, theobromine and theophylline are examples of this group of drugs, which are of doubtful value in the treatment of hypertension.

4. *Nitrites.* This group of drugs, of which sodium nitrite, erythroltetranitrate and mannitol hexanitrate are examples, are of no proven value in the treatment of hypertension. Their action is evanescent and their therapeutic results disappointing. There are numerous proprietary preparations containing these drugs, usually in combination with a sedative and xanthine. If there is any beneficial effect, it is probably from the sedative component.

5. *Sympatholytic drugs.* As indicated by their name, these drugs, broadly speaking, sever the pathways which transmit the sympathetic impulses. These compounds include Dibenamine, the tetraethylammonium salts, Priscoline, and Mecholyl. The results are variable, unpredictable, and usually of short duration; the side effects are many. Their use is not recommended in the treatment of hypertension in the elderly.

6. *Thiocyanate.* Although of value as an anti-hypertensive drug, thiocyanate is not recommended in the individual past the age of 60 years. The unhappy side effect of increasing capillary fragility and predisposing to retinal and cerebral hemorrhage, is only one of its dangers. Its use is best reserved for the younger labile patient with severe hypertensive headaches. Barker (10) found that by checking the blood levels of the drug, he could control the toxic effects. Contraindications to its use (other than in the patient past 60 years) include cardiac, cerebral or renal complications, blood dyscrasias, a history of drug sensitivity and, above all, lack of facilities for blood level estimations.

7. *Dihydrogenated alkaloids of ergot.* The three hydrogenated ergot derivatives, dihydroergocornine, dihydroergocristine, and dihydroergocryptine, combined in equal parts, are available as Hydergine. Its action is thought to be sympatholytic at the hypothalamic level. Tandowsky (11) evaluated the drug after trial in a series of 100 cases, and concluded that its use is impractical for routine therapy of ambulatory hypertensive patients because of its transitory effect on blood pressure and pulse rate. The drug is more popular on the continent than in this country, and reports (12) from there are more favorable.

Hydergine may be administered orally (in drop form or as a sublingual table) parenterally, subcutaneously, intravenously, or by both oral and injection routes.

It is less effective when used orally. The sublingual tablets are available in strengths of 0.3 mg., and the recommended starting dose is one tablet before meals and at bedtime. This is gradually increased until either a therapeutic response is obtained or unpleasant effects warrant its discontinuance. The side effects include gastro-intestinal upset, skin rash, headache, dizziness, or blurring of vision. When used subcutaneously, the dosage recommended is 0.3 mg. at six-hour intervals. gradually increasing the amount.

This drug is best reserved for the treatment of hypertension accompanied by symptoms, and not for treatment of the asymptomatic type.

8. *Veratrum.* This is one of the more recently popularized drugs for the treatment of primary hypertension. Fries (13) has shown that its administration results in a drop in blood pressure. It is not sympatholytic and the effect is thought to be mediated through the central nervous system. The drug has no adverse effect on the cerebral or renal circulation, nor does it cause any change in cardiac output. Were it not for its unpleasant side effect of nausea and vomiting, it would be a desirable drug for use in the hypertension of old age. With careful regulation of dosage, it may be possible to overcome this disadvantage.

Veratrum viride was the first to be employed, and since then many alkaloids have become available. Those in common usage, to name a few, are Veriloid, Vertavis, Anatensol, and Veratrone. One has no distinct advantage over the other. The suggested dosage schedule for Veriloid is a 2-mg. tablet taken after breakfast, and again about two hours after lunch and after dinner. This dosage should be increased by 1 mg. about every third day until a satisfactory blood pressure level is reached. For the average patient, approximately 9 to 15 mg. daily is required.

Recently, a purified derivative of Veratrum album, protoveratrine, has been thought to be superior to the alkaloids of Veratrum viride. Hoobler *et al.* (14) conducted most of the original studies with the drug, and outlined a satisfactory dosage schedule. They found that, under careful supervision, a reduction in blood pressure can be maintained for a period of six to eight hours without inducing the unpleasant side effect of nausea and vomiting. It has been noted that the beneficial effects include relief of hypertensive headache, encephalopathy, and reversal of retinal changes in malignant hypertension. Currens *et al.* (15), after trial on 100 cases, concluded that the drug is useful and reasonably safe.

One of the commercially available products of protoveratrine, Provell Maleate, is available as 0.5-mg. tablets. The suggested starting dosage is one tablet after each meal, with a gradual increase of one-quarter tablet (0.125 mg.) every few days until five tablets are given daily. Some of the unpleasant side effects include tingling in the fingers, a feeling of numbness around the mouth, a feeling of warmth over the head and neck, and a burning sensation in the throat. These do not indicate discontinuance of the drug. Protoveratrine may also be used intravenously or intramuscularly, but for long-range treatment, oral administration is most practical.

More recently a new alkaloid fraction of Veratrum viride has been extracted, designated as cryptenamine, and commercially available as tablets of Unitensin

in 2-mg. strength. Its feature is the relatively high ratio between the hypotensive and the emetic dose. To date, because of its relative newness, there is little reference to it in the literature. It is one of the safer hypotensive drugs and is indicated for the more severe stage of primary hypertension. The recommended starting dosage is one tablet twice daily, to be increased on a week-to-week basis, first by adding a mid-day dose and then by increasing the number of tablets per dose, as dictated by the response of the patient. The tendency toward nausea and vomiting is reduced if the patient refrains from eating for about four hours after taking the medication. When further published reports appear, the value of this drug will be better determined. However, in view of its relative safety, it is worth a trial in the treatment of the more severe case of hypertension in the older age group.

9. *Serpina.* Rauwolfia serpentina, a dried root prepared in tablet form, first studied in India by Rustrom Jal Vakil (16), has been found to have a mild hypotensive effect with only a few unpleasant, and no serious side effects. The drug seems to depress the vasomotor center, with resulting generalized vasodilatation. Its tranquillizing and sedative effect is likewise of value for the hypertensive patient. It is available as the whole root, an example of which is Raudixin, or as the active alkaloid, reserpine, examples of which are Serpasil, Rauwiloid, Rau-Sed, and Sandril. Raudixin is supplied in tablets of 100-mg. strength, the suggested starting dosage being one tablet morning and evening. Of the reserpines, Serpasil and Sandril are each available in tablets of 0.1-mg. and 0.25-mg. strengths, the suggested daily dosage being 1 mg., individualized to the patients' requirements. After the desired effect is obtained, it may be possible to decrease the amount to a much lower daily maintenance dose.

Travis Winsor (17) reports favorably on the use of the drug in a series of 65 cases, as do Livesay and associates (18). It is generally agreed that there are no contraindications, that the side effects are insignificant, and that the drug is helpful in mild hypertension.

The most common of the side effects are nasal congestion (which may be helped by an antihistaminic agent), drowsiness and lethargy. The latter may be of benefit in some cases.

This group of drugs is recommended as antihypertensive agents for the elderly, administered singly in the milder case, or combined with one of the other groups of drugs in the more severe cases.

10. *Apresoline* (*hydralazine*). This is another of the newer antihypertensive agents. Its mode of action is in doubt. Stunkard *et al.* (19) cite evidence which indicates that the major site of action may be peripheral, although it is thought that there is also a central vasodepressor action.

The drug should not be employed promiscuously in the older age group, since its use is attended with a certain element of danger, particularly when there are cerebral, coronary, or renal complications. It should be reserved for cases of essential hypertension with high fixed levels in the younger age group, and for cases of early malignant hypertension.

The most frequent side effects include headache, nausea, vomiting, weakness,

dizziness, faintness, tachycardia and postural hypotension. Less common are nasal congestion, lacrimation, conjunctivitis, and flushing and tingling of the extremities. Dustan *et al.* (20) reported a febrile and rheumatic effect of the drug when administered over a long period of time. Antipyretics and antihistamines are the suggested drugs to overcome the side effects.

The dosage is not fixed, and individualization is required. The oral mode of administration is preferred; the parenteral should be reserved for the patient in coma. The recommended starting dose is 25 mg. taken four times daily after each meal and at bedtime, to be gradually increased by increments of 100 mg. daily to a total daily dosage of 600–800 mg. It is advisable to check blood pressure readings just prior to, and about one hour after administration in order to determine the optimum effect and the optimum daily dose. As soon as practical, the dosage should be dropped to the minimum level which will maintain the optimal therapeutic effect. This may be from 100 to 200 mg. daily. More conservative dosage and smaller increments are advised in the presence of cerebral, coronary, or renal complications.

Generally, Apresoline may be administered for prolonged periods of time. However,. in some patients there is a tendency for tolerance to develop. Such cases can be managed by temporary withdrawal of the drug and then reinstitution of therapy.

11. *Methonium* (*hexamethonium*). This drug, on the basis of combined experience in various studies (21–25) has been shown to be successful in a large percentage of cases. Unfortunately it can be dangerous. Its action is that of blocking ganglionic transmissions through both the sympathetic and parasympathetic ganglia. The side and toxic effects are those due to excessive blocking of such transmissions. These effects include extreme hypotension with its serious sequelae. The potential danger lies in damage to the heart, brain and kidney because of inadequate blood supply. Hence extreme caution must be exercised when using the drug in the presence of involvement of any of these organs. Other side effects are constipation to the point of obstipation and ileus, urinary retention, dryness of the mouth, blurring of vision, and a disturbance of regulation of body temperature on very hot and very cold days.

Measures are available to combat most of these disturbances. For severe hypotension, the foot of the bed should be elevated and a suitable pressor drug such as Neo-synephrine used intravenously. To overcome the results of excessive parasympathetic block, Urecholine or Prostigmine may be taken orally, 10 mg. twice daily. Daily catharsis is indicated when constipation is stubborn.

There are no absolute contraindications to the use of methonium, but it is not a drug of choice in the older age group. In this group, extreme caution must be exercised, both in the choice of the patient, and in the administration of medication. The drug is best reserved for the case of malignant hypertension which does not respond to the more harmless agents and which presents effects secondary to the hypertension, *i.e.*, headache, papilledema, retinal changes, dyspnea, and pulmonary congestion. These secondary effects often show regression when the drug proves to be beneficial.

Each patient requires individual adjustment of the dose. There is a large variation among different individuals. In some there is tolerance, and a larger dose is required. In others (particularly when the patient has cardiac, cerebral or renal complications, is on sodium-poor diet, or has been sympathectomized), smaller amounts are indicated. Constipation is a factor in the determination of dosage, in that there may be a cumulative effect with continued slow absorption from the bowel. The absorbed drug is excreted quantitatively in the urine, hence smaller dosage should be used when there is impaired renal excretion.

Evaluation of the patient, and dosage determination and adjustment are best carried out in a hospital. It is suggested that the initial dose be kept low, and gradually increased. The drug is available in tablets as the bromide, iodide, chloride, and bitartrate. Tablets of hexamethonium chloride are prepared in strengths of 125, 250, and 500 mg. A 125-mg. tablet is given before breakfast, checking the blood pressure prior to, and about half an hour and one hour after its administration. If well tolerated, and as dictated by the sensitivity of the patient, the dose can be repeated before each of the noon and evening meals and again at bedtime. If there is no adverse effect, the dose can be doubled the following day, tripled on the third day, and thus gradually increased. Each increase is regulated by the reaction of the patient. A daily dosage of about 3 grams is usually required. It may be necessary to increase it to as much as 5 grams daily, but this amount should not be exceeded. Continued checking of the blood pressure is desirable, even after discharge from the hospital. For this purpose, it is best to train a member of the family.

The parenteral dose, administered subcutaneously every eight to twelve hours, must be determined with great caution. When the drug is administered in this manner, it is seldom effective beyond a few days, thus making it necessary to increase the dose gradually to a total of 50 mg.

Difference of opinion exists as to the advisability of the use of the methonium drugs. Wilkens (26) is more impressed with its hazards than with its clinical benefits, and only when early death appears inevitable does he subscribe to the use of the drug.

12. *Ansolysen* (*pentolinium tartrate*). This is one of the newer ganglion blocking agents which has proved effective in the management of cases of severe and malignant hypertension. Its greater potency, more uniform and predictable response and fewer pharmacologic side effects make it a suitable therapeutic agent in such cases. Its use is contraindicated in the presence of severe coronary artery disease and in the presence of organic pyloric stenosis. It should be used with caution in the presence of cerebral arterial disease or in patients with renal impairment or even mild coronary insufficiency. In view of the frequency of one of these complicating factors in the older age group, patients must be carefully chosen before administering this agent.

As with the methonium drugs, constipation has to be prevented by suitable catharsis; if necessary, oral neostigmine should be administered in doses of 15–30 mg. daily. Other unpleasant side effects, if the drug is not used properly, include postural hypotension, dryness of the mouth, blurred vision, and urinary

retention, particularly in males with an enlarged prostate gland. Most of these effects can be eliminated by careful adjustment of dosage and by administering pilocarpine nitrate, 2.5 to 5 mg., with each dose of the drug.

Fries (27, 28), Hoobler (29) and Smirk (30) are a few of the many who have reported favorably on the drug and who have played a prominent role in determining dosage and mode of administration.

Ansolysen is equally effective orally and subcutaneously; hence the oral mode of administration is preferred. Although home blood pressure determinations are of value in determining dosage, they are not entirely necessary. Almost equally good control is obtained by watching for the appearance of symptoms of hypotension (such as faintness or light-headedness) when assuming the standing position—the position in which maximum response to the drug is produced.

Ansolysen is available as tablets in strengths of 40 and 100 mg. The recommended starting dose is 20 mg., taken before or after breakfast and repeated at eight-hour intervals. Each dose should be increased by 20 mg. every second day until the patient experiences mild symptoms of postural hypotension at the time of maximum action of the drug. The ideal dose is usually 20 mg. less than that dose which causes mild symptons of postural hypotension. The dosage must be individualized, but once determined, is usually uniform. The average intelligent patient soon learns to make whatever small changes may be required in the maintenance doze.

13. *Combined drugs.* Of the newer antihypertensive agents, veratrum and its alkaloids, rauwolfia and its alkaloids, dehydrogenated alkaloids of ergot, hydralazine (Apresoline), methonium, and pentolinium (Ansolysen), any combinations may be made, with the exception of methonium and Ansolysen. As a general rule, when a combination of drugs is used, it is advisable to start with one, the less potent, and then gradually add the other or others, cautiously, starting with a small dose and gradually increasing. It will generally be found that a smaller dose of the more potent agent will be required to attain the therapeutic result when drugs are combined.

Of these drugs, the serpina group is most successfully used in combination, whether it be with Apresoline, methonium, or Ansolysen. The veratrum group, likewise, is commonly used with the more potent agents. The combined use of three agents, serpina, veratrum, and one of the more potent drugs may be tried. Should two of the more dangerous agents such as Apresoline and methonium be combined, extreme caution must be used in the choice of the patient and the mode of administration. It is wiser, in the older age group, to avoid combining two potent agents. The more experience the physician gains in the use of these newer antihypertensive agents, the more adept he becomes in handling them, whether individually or combined.

Other measures

Deserving of more mention are certain other measures which should be employed in the management of hypertension in the older age group.

1. Correction of an abnormal hemoglobin level and red blood cell count. Experience has shown that in the hypertensive patient with a polycythemic tendency, thrombotic cerebral or coronary complications are more prone to develop. An occasional phlebotomy to correct such a tendency might be valuable. On the other hand, if an anemic condition exists, correction by means of hematinic agents may help to prevent the renal complications of the hypertension.

2. Increased capillary fragility has been suggested as a factor in cerebral and coronary-artery thrombotic disease, as well as in the retinopathy which not uncommonly complicates hypertension. This is particularly true in the older age group. The use of rutin and ascorbic acid may restore, to some extent, the normal tension of the capillaries; it is worthy of a trial in the management of the elderly hypertensive patient. Although it offers no direct benefit in reducing the hypertension, it may be of some value in reducing the incidence of some of the more serious complications.

Surgical procedures

Surgical procedures should rarely, if ever, be resorted to in a hypertensive patient of the older age group. These operations are all radical, and require rigid indications before they are undertaken. One of the important determining factors in the choice of the patient is age, and it is unusual to subject a patient past middle age to one of these drastic operations. It is far safer and wiser to resort to the newer antihypertensive drugs in the older age group.

The recognized operative procedures used for treatment of primary hypertension are:

1. Sympathectomy—the oldest and most popular operation.
2. Adrenalectomy, partial or complete.
3. Adrenalectomy associated with sympathectomy.

SUMMARY

The various means available for the treatment of primary hypertension are presented, with special emphasis on those more suitable for use in the older age group.

For the milder asymptomatic hypertensive patient, emphasis should be placed on details of every-day living habits, diet, psychotherapy, and the use of the less potent drugs. The milder sedatives, the veratrum and serpina groups of drugs, are recommended.

For the more severe case with symptoms and complications, or for the patient with a progressively rising blood pressure, the more potent therapeutic agents, hydralazine, methonium, or pentolinium are indicated. Caution must be exercised in the selection of the patient, and in the administration of these agents, particularly when cerebral, coronary, or renal complications exist.

The use of a combination of the milder drugs and one of the more potent variety usually provides a more satisfactory method of therapy.

The correction of abnormalities in the hemoglobin level or red cell count

and an attempt to reduce capillary fragility by the use of rutin and ascorbic acid are advised, in order to prevent some of the more serious complications of hypertension.

Surgical procedures for the treatment of hypertension are not advised in the older age group.

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NECESSITY OF PROCTOSIGMOIDOSCOPY IN RECOGNITION OF ANORECTAL DISEASE: A CONTROLLED STUDY

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The recognition of anorectal disease is an important aspect of preventive medicine and cancer control. Certainly no physical examination should be considered complete until visual and digital examinations of the genital and anorectal areas have been made. The careful examiner is occasionally able to detect the presence of anorectal and perirectal (*i.e.*, prostatic, pelvic or metastatic) lesions by the simple expedient of digital examination. Unfortunately, the same examiner all too frequently meets with the most unpleasant surprises should he cross-check his digital findings by means of subsequent proctosigmoidoscopy. He is chagrined to find that one of three things may have occurred: 1) the "lesion" originally palpated is in reality nonexistent; 2) the lesion turns out to be something else (*e.g.* suspected enlarged anal papilla may actually be an anorectal polyp); or 3) a lesion may be revealed that was completely missed on digital examination.

Because of the wide discrepancies between impressions gained by digital examination and by subsequent proctosigmoidoscopy, we have recently undertaken a controlled study in an effort to ascertain the accuracy of the digital examination as routinely performed in the admission physical evaluation of patients seen in this institution. We believe the results establish unequivocal evidence that proctosigmoidoscopy is a desirable procedure in all patients and is mandatory in every patient who has any complaint referable to altered bowel function, or who has a suspected abnormality noted at the time of digital examination.

METHOD

The records of 500 consecutive patients subjected to proctosigmoidoscopic examination at the Guthrie Clinic and Robert Packer Hospital during the first three months of 1954 were reviewed. Proctoscopic findings were then compared to the digital rectal findings in the record of the admission physical examination. In addition, it was noted whether the patient was examined as a mere routine or because of some specific bowel complaint (*e.g.* constipation, diarrhea, change in caliber of stool, passage of blood or mucus per rectum, or local pain).

Most examiners should be able to palpate to a depth of 3 to 3½ inches when carrying out a digital rectal examination. For purposes of comparison we have, therefore, arbitrarily considered all lesions noted within 3 inches of the anal orifice by proctosigmoidoscopy to be within reach of the examining finger.

RESULTS

Of 500 patients so examined, 363 or 72.6 per cent of the entire group were found to have some abnormality by proctosigmoidoscopy, and 327 or 65.4 per cent

TABLE 1

Abnormalities Noted in 500 Consecutive Proctosigmoidoscopies

Abnormality	No. of times noted	Per cent of total
* Altered bowel function	64	12.8
* Proctitis	16	3.2
* Chronic ulcerative colitis	10	2.0
Hemorrhoids	127	25.4
Fissures (deep and superficial)	41	8.2
Fistula in ano	8	1.6
Hypertrophic anal papillae	38	7.6
Neoplasms (benign and malignant)	58	11.6
Neoplasms in reach of finger	22	5.5

* Entities not expected to be detected on digital examination, even though present in the lower three inches of the bowel.

were found to have the abnormality in that segment of bowel accessible to the examining finger (*i.e.*, the distal 3 inches). Only 126 or 25.2 per cent of the entire group were found to have an abnormality by digital rectal examination, and in the subsequent analysis many of these abnormalities were found to be either nonexistent or falsely interpreted.

Distributions

There were 274 males and 226 females included in this study. Of the total of 500 patients, 270 or 54 per cent had one or more complaints referable to altered bowel function. The age distribution ranged from 4 to 83 years inclusive. The abnormalities noted at the time of sigmoidoscopy are listed in Table 1.

Analysis of specific findings

I. *Anorectal abnormalities not expected to be felt on digital examination*

A. *Altered physiology.* Nonspecific indications of disturbed bowel function may sometimes become apparent to the proctoscopist by his observation of any of the following: 1) increased mucus, 2) spasm, 3) reproduction of the presenting complaint of pain by insufflation of air into the bowel, or 4) redundancy of the colonic mucosa. These findings are frequent in patients with irritability of the colon and in those who are chronic laxative addicts. It is of utmost importance for the examiner to realize that these so-called functional changes may also occur in association with serious organic lesions of the bowel or distant organs, as well as secondary to psychogenic stimuli or local irritation from purges or enemata used preparatory to examination.

Sixty-four patients (12.8 per cent) demonstrated one or more of the foregoing changes at the time of proctosigmoidoscopy. In 5 the condition was correctly diagnosed as either redundant mucosa or sphincter spasm on digital examination.

B. *Proctitis.* Sixteen patients (3.2 per cent) had evidence of minimal to severe grades of proctitis as shown by edema, hyperemia, granularity and friability of the rectal mucosa. In 5 of the 16, these disorders were believed to be due to the

laxative and enemata used in preparation for examination, as no previous bowel complaints could be elicited.

C. *Nonspecific ulcerative colitis.* Ten patients (2 per cent) were found to have chronic ulcerative colitis. Cultures and smears from all failed to demonstrate any specific pathogens known to cause ulcerative lesions of the colon (*i.e.*, Salmonella, Shigella or Endamoeba histolytica), and roentgenograms in all cases showed changes typical of ulcerative colitis of varying degrees of severity.

II. *Anorectal lesions accessible to the examining finger*

A. *Hemorrhoids.* One hundred and twenty-seven patients (25.4 per cent) were found to have hemorrhoids. Only 21 cases were correctly diagnosed by digital examination. In 13 patients suspected of having hemorrhoids on digital examination, the rectum was proved to be normal at the time of proctosigmoidoscopy. Fifty-six of the group had no bowel complaints, and only 8 had lesions causing sufficient trouble to require surgical removal. Three-fifths of those with hemorrhoids were males.

B. *Fissures.* Forty-one patients (8.2 per cent) were found to have fissures of the anal mucosa. Many of these lesions were superficial and required no specific therapy. Eight were of sufficient depth to require surgical excision. Five were correctly diagnosed by visual and digital examination. One fissure, "felt" at the time of digital examination, was proved nonexistent upon proctosigmoidoscopy. One patient with a chronic fissure was suspected of having a carcinoma of the posterior rectal wall on digital examination, the examiner misinterpreting excessive granulation tissue as tumor tissue. Many of the more superficial fissures were doubtless caused by purgatives, enemata or straining at the stool during preparation for the examination.

C. *Fistula-in-ano.* Eight patients (1.6 per cent) were shown to have fistula-in-ano. All had bowel complaints and all had lesions requiring surgical excision. Seven of the 8 fistulae were correctly diagnosed by visual and digital examination.

D. *Hypertrophied anal papillae.* Hypertrophied anal papillae are in themselves clinically insignificant, except in the presence of active cryptitis or papillitis. Their importance arises from the fact that they are frequently misinterpreted by digital examination. Thirty-eight patients (7.6 per cent) were found to have enlarged papillae by proctoscopy, but in only 2 patients were they correctly noted on the admission digital examination, and seven examiners "felt" enlarged papillae that were either nonexistent or proved to be other lesions at the tine of proctoscopy.

E. *Neoplasms.* Of 500 patients examined both digitally and by proctosigmoidoscopy, 58 (11.6 per cent) were found to have neoplasms in the distal 10 inches of the bowel. Twenty-two of these, or 4.4 per cent of the entire group, had neoplasms in that area accessible to the examining finger. However, only 2 of these 22 neoplasms were correctly recognized on digital examination. Many of the lesions were only a few millimeters in diameter and could not possibly have been noted on digital examination. Nevertheless, sigmoidoscopy offered the only

method for their early detection. On pathologic section, 46 of the 58 neoplasms in the distal 10 inches of the bowel proved to be benign polyps. Five of these showed early changes of malignant degeneration characterized by atypical cellular arrangement, loss of nuclear polarity, variation in staining qualities, but no evidence of invasion at the base. All lesions were either totally removed or subjected to biopsy at the time of their discovery and no lesions were fulgurated before a biopsy specimen was obtained.

Seven patients had frank adenocarcinoma of the bowel and it is interesting that 1 of these had no bowel complaints and was examined only as part of a routine physical checkup. Three carcinomas were within reach of the finger and 2 were correctly diagnosed by digital examination.

Of the total group of 58 patients having neoplasms, 25 (less than half) had complaints referable to altered bowel function. In 7 patients suspected of having neoplasms by digital examination, no lesions were found at the time of proctosigmoidoscopy.

COMMENT

Lesions of the colon and of the anorectal area are of such common occurrence that it behooves the physician to have a high index of suspicion concerning their presence, regardless of the patient's complaint. Although this study does not attempt to encompass the investigation of the entire colon, suffice it to say that an adequate appraisal of the large bowel must include a complete history and physical examination as well as digital rectal examination, proctosigmoidoscopy, barium enema, and air-contrast studies when indicated. No one of the foregoing is complete in itself and each must be considered as a supplement to the other.

It has been the authors' purpose in the present study to determine the incidence of anorectal lesions and also to assess the value of digital examination in their detection. The results show rather conclusively that many lesions are falsely interpreted and many more are missed entirely if digital examination alone is employed.

Digital examination must be supplemented by proctosigmoidoscopy if the anorectal region is to be evaluated properly. Of all the diagnostic aids available to the general practitioner of medicine, there are few, *if any*, that so consistently yield such a large number of significant findings as does proctosigmoidoscopy. This has been amply demonstrated in a larger series of 3,500 cases previously reported by Shallenberger and Fisher (1).

Of all lesions common to the anorectal area, polyps and frank malignant growths are certainly the most important from the prognostic aspect. Unfortunately, it is these very lesions that are more often missed than detected by digital examination alone. It is of interest that approximately one tenth of all persons subjected to proctosigmoidoscopy harbor a neoplastic lesion in the lower 10 inches of the bowel. This figure of 10 per cent incidence of neoplasm has remained almost constant in our practice, regardless of the number of cases sampled, and it is even more impressive when one notes that more than half of those patients

having neoplasms have no complaints referable to change in bowel habits. These cases would obviously not have been detected had sigmoidoscopy not been performed as a routine part of the complete physical appraisal.

CONCLUSION

Although digital rectal examination is of definite value in the detection of rectal and perirectal abnormalities, it is not of sufficient accuracy to determine the exact nature of such lesions. Furthermore, many significant lesions are missed entirely if digital examination is the only method used in evaluation of the anorectal area. Digital examination supplemented by proctosigmoidoscopy offers the only practical means for detecting anorectal lesions at an early and curable stage.

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THE USE OF VITAMIN THERAPY TO REVERSE CERTAIN CONCOMITANTS OF AGING*

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Perhaps the saddest fact that every human being must face is that, if he lives long enough, he will eventually undergo progressively increasing deteriorative changes in the structure and function of his body until these become so severe that he can no longer survive. The so-called "normal" aging process makes his joints less flexible, decreases his muscular working capacity and strength, impairs his co-ordination and sense of balance, brings about mental changes, and increases capillary fragility—in addition to causing many other obvious or subtle changes in the bodily structure and function.

Is there anything we can do today therapeutically to reverse or lessen the severity of one or more of these concomitants of aging?

The author's clinical studies, pursued for the past twelve years, offer considerable encouragement, since continuous oral administration of large amounts of properly selected vitamins for prolonged periods of time to persons eating a diet containing adequate protein and calories does much to alter in a favorable direction some of the concomitants of aging. Of the vitamins studied, the only one regularly administered parenterally to selected patients was vitamin B_{12}, since this material is poorly absorbed when taken orally (1).

Figure 1 shows the age-frequency distribution of 842 ambulatory private medical patients aged 4 to 80, who were examined by the writer. Of these, 663 accepted treatment with niacinamide (alone or in combination with other vitamins) for prolonged periods of time varying from a few months to nine years. The effects of vitamin therapy on joint mobility, muscle strength and working capacity, balance sense, mental depression and capillary fragility will be described.

MOBILITY OF JOINTS

In a previous communication (2) a method for determining the Joint Range Index (J. R. I.) from measurement of the maximal mobilities of twenty specified joint ranges was described. Those joint movements which were routinely measured with goniometric instruments were (a) lateral rotation of the neck to the right and left, (b) extension and flexion of each wrist joint, (c) extension of the metacarpophalangeal joints of each of the four fingers of both hands, (d) circumduction of each shoulder joint, (e) abduction of each hip joint with the thigh maintained perpendicular to the trunk, and (f) extension of each knee with its thigh maintained at right angles to the trunk. The method of making accurate measurements of maximal motion of each of these joint ranges is described in detail elsewhere (2).

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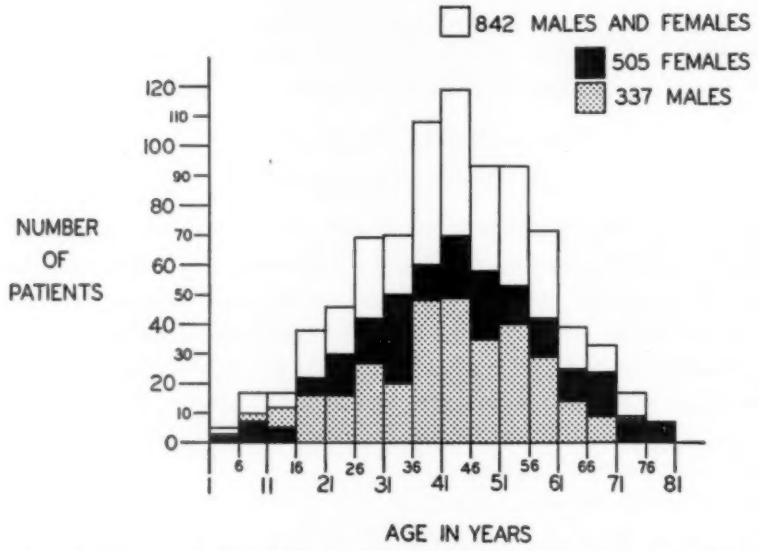

FIG. 1. Age-frequency distribution of the 842 ambulatory patients in the series.

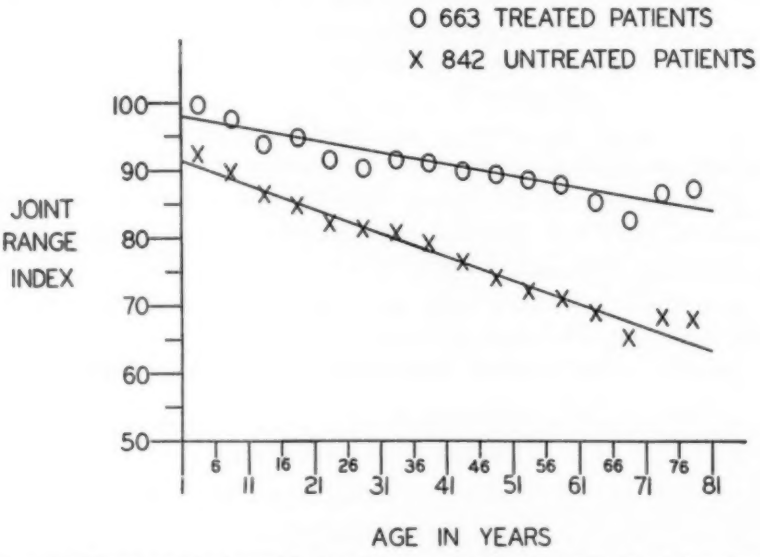

FIG. 2. Effect of niacinamide therapy on decline in J. R. I. with aging.

Using this sensitive, objective and easily reproducible measure of a patient's joint flexibility, it was possible to evaluate the effects of vitamin therapy on the mobility of the joints in individual patients, as well as for the entire group taking treatment. Without exception, the joint mobility in every patient taking adequate amounts of niacinamide alone or in combination with other vitamins improved to a clinically significant extent (3).

Figure 2 shows the linear decline in joint mobility with aging in the untreated population, as well as the changes in the slope of this line when the highest J. R. I.'s achieved during treatment with niacinamide (alone or in combination

TABLE 1

Joint range index	Clinical status	Oral dosage schedules of niacinamide per day	Range of total niacinamide taken per 24 hrs. (mg.)
96–100	No joint dysfunction	—	—
86–95	Slight joint dysfunction	150–250 mg. every 3 hrs. for 6 doses	900–1,500
71–85	Moderate joint dysfunction	250 mg. every 3 hrs. for 6 doses; or 250 mg. every 2 hrs. for 8 doses	1,500–2,000
56–70	Severe joint dysfunction	250 mg. every 2 hrs. for 8 doses; or 250 mg. every 1½ hrs. for 10 doses	2,000–2,500
55 or less	Extremely severe joint dysfunction	250 mg. every 1½ hrs. for 10 doses; or 250 mg. every hr. for 16 doses	2,500–4,000

with other vitamins) were similarly plotted according to successive five-year age groups. This chart shows that the progressively impaired joint mobility occurring with increasing aging is reversible to a clinically significant extent when the dosage schedules shown in Table 1 are used.

In several thousand patient-years of using from 900 to 4,000 milligrams of niacinamide per day in divided doses prescribed according to the criteria set forth in Table 1, no patient in this series experienced any untoward reaction to this vitamin at any time. (However, as rarely happens, if a druggist mistakenly dispenses niacin or some admixture of niacin and niacinamide, instead of pure niacinamide, the patient taking such a preparation may experience unpleasant flushing, itching of the skin and gastric distress.)

In individual cases (Fig. 4), niacinamide therapy raises the J. R. I. from 6 to 12 units during the first month of therapy, and from 0.5 to 1.0 unit each month that therapy is continued therafter. Although the J. R. I. increases in all patients treated, some ankylosed joints show no improvement in mobility despite prolonged niacinamide therapy. Other equally immovable joints may in the course of prolonged niacinamide treatment recover partial or full ranges of movement. In all instances, niacinamide therapy will cause the joint mobility of each patient to improve to a degree which is in advance of the expectancy for his age in the untreated group.

Although in some patients values of the J. R. I. may reach a level as high as 96.0, in others showing improvement the level may stabilize at 86.0 or better. Only a prolonged trial of therapy will prove whether or not a given individual will have maximal improvement from continuous oral niacinamide treatment.

The improvement in joint mobility induced by niacinamide was not enhanced by (a) the addition of 1,500 to 4,000 milligrams of vitamin C (ascorbic acid) in divided doses per day, (b) the foregoing dose of ascorbic acid and 54 milligrams of riboflavin and 27 milligrams of thiamine, or (c) the latter combination plus pyridoxine and calcium pantothenate, each in the amount of 54 milligrams per day. Furthermore, the addition to any of these combinations of 5,000 to 100,000 U. S. P. units of vitamin A and 500 to 9,000 U. S. P. units of vitamin D, or the

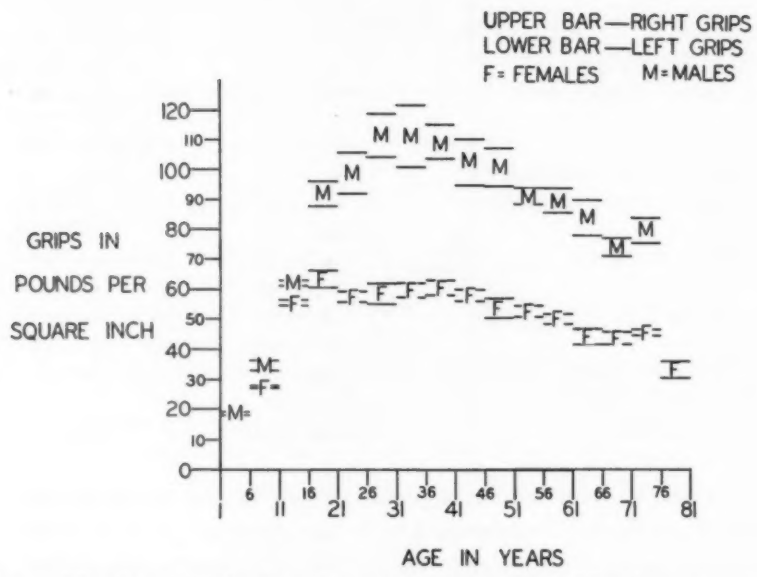

FIG. 3. Muscle strength of males *vs.* females measured by dynamometer.

addition of 100 micrograms of vitamin B_{12} once or twice weekly by intramuscular injection to any of the foregoing therapeutic combinations did not enhance the ability of niacinamide to improve joint mobility. The action of niacinamide was not retarded by the addition of any of these vitamins in the doses indicated.

SOMATIC MUSCLE FUNCTION

Many patients, especially those in the older age groups, noticed an improvement in their strength and exercise tolerance soon after niacinamide therapy was begun. When this beneficial effect on muscle function occurred, it reached a peak during the first three months of treatment and continued in most patients for as long as they were taking their vitamins in the prescribed amounts.

To obtain a simple, objective measure of muscle function, the patient's maximal muscle strength was determined by measuring maximal working capacity of the muscles operating the right thumb.

The muscle strength of maximal right and left hand grips of 283 males and 458 females as measured by the hand dynamometer in pounds per square inch is shown in Figure 3. (Females are the weaker sex!)

Working capacity of the muscles operating the right thumb was measured in terms of the maximal number of strokes the patient could make on a hand tally register in one minute. It took 477 grams to depress the lever, which moved 0.7 centimeter to register each stroke. The normal range was from 240 to 270 strokes per minute and this performance could be maintained for one minute at these high working rates without muscular discomfort, pain or fatigue.

Figure 4 shows the effects of niacinamide therapy (give alone or in combination with other vitamins) on the patient's joint mobility as represented by the J. R. I., muscle strength, and maximal working capacity.

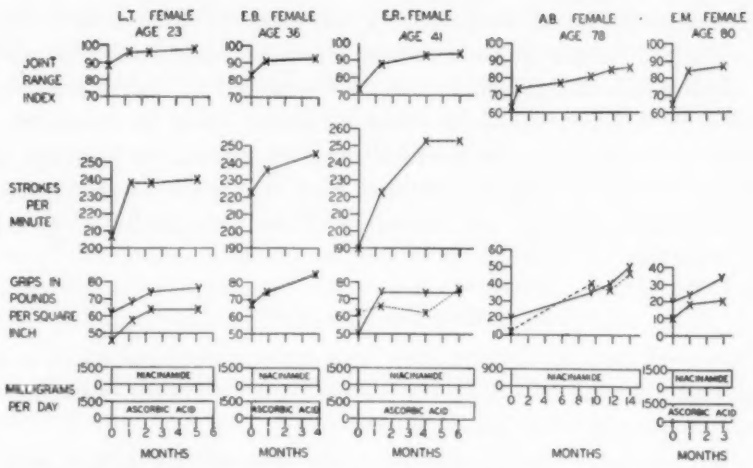

FIG. 4. Effect of niacinamide, alone or in combination, on J. R. I., muscle strength, and maximal working capacity.

When the effects of niacinamide on somatic muscle function were first observed in 1942 (4), placebo control studies in a small group of trained and untrained volunteers showed that any major improvements in muscle function, as shown by increased working capacity and by decreased muscular discomfort, pain and fatigue in the working muscles during the performance of the hand tally register test, must be ascribed to the pharmacologic effect of niacinamide. Placebo controls could not be used in the author's private practice in the study of the large groups of treated patients.

Not all patients receiving niacinamide therapy experienced improvement in muscle function, even though without exception they showed improvement in the mobility of their joints. If improvement in muscle function was not evident within the first three months of treatment, it usually would not occur even after a longer trial of therapy with niacinamide alone. However, when thiamine and riboflavin were added to niacinamide, some patients experienced prompt improve- in muscle function. Others needed choline dihydrogen citrate in divided doses amounting to 2.4 grams per day in addition to niacinamide and other members of the B complex before they experienced improvement in muscle function. Surprisingly, in patients with weak, flabby muscles who benefited from choline used in this manner, there was development of muscle turgor and tone, to a degree expected in people who do moderately heavy physical work—even though these patients continued their sedentary existence. Perhaps in such instances choline supplies much-needed labile methyl groups for enzymatic and metabolic processes which ultimately give rise to muscle power.

About 30 per cent of patients with impaired muscle function experienced no improvement in this respect with any combination of vitamins employed in this study.

During niacinamide treatment (alone or in combination with other vitamins) muscle function improved in a significant number (70 per cent) of patients. Such

treatment created no super-men or super-women. It tended to restore muscle function to normal ranges in those whose function was below par initially, and raised the muscle function of others from the lower to the upper range of normal. This property of niacinamide and other vitamins, used as described, restored many patients to a state of vigor which permitted them to perform their daily duties without excessive fatigue, whereas they had been unable to do so prior to treatment. When therapy was terminated they gradually reverted to their pretreatment status.

SENSE OF BALANCE

Some untreated patients in the older age groups complained of a subjective sense of unsteadiness and lack of co-ordination. A few of them swayed abnormally in the Romberg position, but most did not.

An impaired sense of balance may be easily demonstrated by a more delicate test. The patient is asked to stand on one foot, holding his hands by his sides, and abduct and laterally rotate the thigh of his free lower extremity so that he can maintain the heel of his free foot in front of, but not touching the patella of the extremity on which he is standing. This test is carried out first with the patient's eyes open, and then with his eyes closed, first standing on one foot, and then on the other. After brief practice, a normal person should have no trouble in maintaining his balance for from ten to fifteen seconds on either foot without swaying, with his eyes open or closed (4).

Many patients with subjective and objective evidence of impaired balance sense recover their ability to balance themselves normally during the first three months of niacinamide therapy and this benefit continues for as long as they take this vitamin.

Careful studies performed on normal aviation cadets by Frankau (5) for the Royal Air Force during World War II indicated that the administration of niacinamide immediately before exercises which were especially demanding significantly improved balance and muscular co-ordination.

Those whose equilibrium is not corrected by niacinamide alone sometimes notice marked improvement in this respect when they take in addition vitamins B_1, B_6 and B_{12}. In this series, some patients in the older age groups experienced no beneficial effect on dysequilibrium no matter what form of massive vitamin therapy was used, even though they felt improved in other respects.

MENTAL STATES—DEPRESSION AND HYPERKINESIS

When first seen, about 10 per cent of the patients in the older age groups were mildly depressed for prolonged periods of time. Another 5 per cent were easily agitated and generally hyperkinetic, over-reacting to noise and verbal and other stimuli. None of these patients had classic pellagra. However, both the agitated hyperkinetic state and the depression disappeared for as long as niacinamide therapy was continued (4, 6–9). Only a trial of adequate therapy will show which patients with these conditions will respond favorably to niacinamide and which will not. Some patients require other components of the B-complex group, espe-

cially B_1, B_6 and B_{12}, before recovery takes place (10). Some agitated and depressed individuals are not helped by massive vitamin therapy (11).

These beneficial effects of niacinamide on central nervous system function have been previously reported by the author and many others (4, 6, 8, 12, 13). However, such improvements have been erroneously ascribed by some authors to the vasodilating effects of niacinamide on cerebral arterial circulation. Direct measurements of cerebral blood flow show that neither niacin nor niacinamide is a cerebral vasodilator (14). The favorable effects on cerebral function are probably the result of profound improvement in the metabolism of the central nervous system, initiated directly or indirectly by the administration of niacinamide.

CAPILLARY FRAGILITY AND VITAMIN C

The capillary fragility of 150 patients who did not have diabetes or hypertension was determined by maintaining a blood pressure cuff on either arm inflated to a level midway between systolic and diastolic for fifteen minutes. Fifteen minutes after the occluding cuff was removed, the petechiae in a flexor area of the skin of the forearm about 6 centimeters below the antecubital fold and 9 centimeters square were studied grossly. With the aid of preselected Kodachrome transparencies of various densities of petechiae, it was possible to set up rough but clinically meaningful standards for grading the patient's capillary fragility. The degree of fragility was expressed as normal, or as abnormal, + to ++++.

After the age of 50, with increasing age there was a significant trend toward increased capillary fragility, even in those patients who had from 50 to 75 milligrams of ascorbic acid in their average daily diet. Decreased blood levels of vitamin C have been reported in older people (15, 16). In some of these older people, careful observation revealed a few to a moderate number of spontaneous perifollicular petechiae on the skin of the legs. In 2 patients, these became exceedingly prominent following exposure to the sun in sun-bathing.

No patient had classic acute scurvy. Some had a clinical picture resembling slightly the changes found in the experimental monkey with chronic vitamin C depletion. Niacinamide had no effect on the patient's capillary fragility. However, in response to oral administration of ascorbic acid (1,500 to 2,000 milligrams per day, in divided doses of 250 milligrams) the capillary fragility progressively became less marked over a period of three to six months of treatment. In some of the oldest patients with initial ++++ capillary fragility, this condition could not be reduced below +, despite three to six months of continuous oral therapy with these large doses of vitamin C. Cessation of vitamin C treatment was followed by a gradual return of capillary fragility to the original grade over a period of two months.

Older patients who still had their own teeth noticed during combined vitamin C and niacinamide therapy that there was tightening of loose teeth. Their dentists spontaneously commented on the improvement in gum structure in response to ascorbic-acid therapy. A dentist who followed 8 of these older patients who took both niacinamide and vitamin C for more than six years noticed

that he did not find the anticipated resorption of alveolar tissue so often seen as part of aging.

VITAMIN B_{12}

In 1941 the author saw a man and a woman who had symptoms suggestive of pernicious anemia with early central nervous system involvement; but they had no anemia, had free hydrochloric acid in the gastric juice, and a normal response to histamine. Their clinical symptoms disappeared when they were given 30 U. S. P. units of liver extract intramuscularly twice weekly but recurred after several weeks when this therapy was discontinued. Resumption of therapy again caused disappearance of these symptoms.

Since that time 35 patients, all above the age of 45, have been seen with a similar syndrome which was not alleviated by niacinamide, vitamin C, thiamin, riboflavin, pyridoxine and calcium pantothenate administered orally in large doses every two or three hours during the day. However, when they were given in addition large doses of vitamin B_{12} once or twice weekly, they recovered and remained free from symptoms for as long as this therapy was continued. They required more B_{12} than patients with pernicious anemia in order to be maintained in a state of remission (17). These patients did not have tropical sprue.

In this series, 10 were males; 25 were females. Their ages ranged from 45 to 80. Gastric analysis was performed in only 3; 2 had free hydrochloric acid and 1 had achlorhydria. Some of these patients presented the syndrome which was alleviated by B_{12} administration when they were first seen; in others it developed during the course of niacinamide treatment.

The following symptoms were a constant feature of the syndrome: increased fatigability, increased nervous irritability, mild impairment in memory and ability to concentrate, mental depression, insomnia and mild dysequilibrium. Inconstant symptoms included paresthesias, dyspepsia, difficulty in bladder control, and breathlessness associated with impaired heart muscle sounds. No patient had anemia. None had loss of vibratory sense. Few had redness of the tip of the tongue with smoothing of the lateral margins.

This syndrome was not benefited by any of the vitamins except B_{12}. It disappeared within the first two weeks of treatment when the patients were given 100 micrograms of vitamin B_{12} intramuscularly once weekly. When a dose of 30 micrograms was given intramuscularly once weekly, improvement was less marked and less well sustained.

If the patient felt improved during the first few weeks of therapy and stopped treatment, he often experienced a prompt recurrence of symptoms. No placebo injections were used. However, on several occasions 30 micrograms of vitamin B_{12} were substituted for 100 micrograms in the intramuscular injections, without the patient's knowledge. In such instances, the patient would then spontaneously complain that he felt less well.

Patients who were treated with 100 micrograms of B_{12} once or twice weekly for three months or longer might have a recurrence of their symptoms within a week of stopping therapy, but more often they continued to be asymptomatic

for from three to nine months; then there would be a slow recurrence. Re-institution of B_{12} treatment was effective in ameliorating these symptoms.

Most of the patients who had this syndrome had noticed prior to its onset that they had experienced marked graying of the hair. B_{12} therapy did not cause the hair to become less gray.

DISCUSSION

Vitamins used in doses which are far in excess of quantities available from food as it is ordinarily prepared and eaten may be considered to act as pharmocologic agents. The prolonged continuous oral administration of niacinamide (alone or in combination with other vitamins) can effect remarkable changes in bodily function and structure of an aging population which subsists on a diet adequate in calories and protein.

How do the vitamins act when used in pharmacologic doses to effect beneficial changes in aging tissues? Three possibilities suggest themselves: (a) they may have a direct beneficial effect on cellular metabolism, thus improving tissue function, (b) they may have an indirect beneficial effect based on the mass-action principle, thus reducing the rate of breakdown of certain important vitamin-containing enzyme systems, or (c) they may favor by mass-action effect the production of greater amounts of certain vitamin-containing enzyme systems which, in turn, favor the creation of more "youthful" function and structure of aging tissues.

As demonstrated, vitamin therapy when properly chosen can improve joint mobility, muscular working capacity and strength, dysequilibrium, capillary strength and certain mental syndromes which are concomitants of aging.

SUMMARY

This study concerns 842 ambulatory patients from 4 to 80 years old, who were examined in private medical practice. Of these, 663 accepted treatment with niacinamide (alone or in combination with other vitamins) for prolonged periods of time, varying from a few months to nine years. Without exception, those taking from 900 to 4,000 milligrams of niacinamide in divided doses per day (alone or in combination with other vitamins) had a clinically significant, measurable improvement in joint mobility, regardless of age. This improvement was maintained for as long as treatment was administered. In addition, during such vitamin therapy, there was improvement of muscular working capacity and strength, dysequilibrium and certain mental syndromes which are common concomitants of aging, in about 70 per cent of the patients. When large doses of ascorbic acid (1,500 to 4,000 milligrams in divided doses per day) were added to the niacinamide therapy, there was improvement in the increased capillary fragility which so commonly occurs with aging, for as long as the vitamin C was taken.

A new syndrome occurring in 35 men and women over the age of 45, which responded only to intramuscular injections of vitamin B_{12}, is described for the first time. None of these patients had pernicious anemia or sprue. When given

100 micrograms of B_{12} once or twice weekly, the syndrome disappeared for as long as therapy was maintained. Discontinuance of therapy often led to a prompt or slow relapse. Re-institution of therapy again was followed by improvement.

The aging body can, under the conditions of vitamin therapy described, reconstitute some of its functions so that the individual may have improvement in joint mobility, muscular working capacity and strength, and capillary wall strength, and have freedom from dysequilibrium and certain mental syndromes which are the concomitants of aging. These observations suggest that some of the concomitants of so-called "normal" aging are today reversible to a clinically significant degree.

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RESPIRATORY RESPONSE IN THE AGED*

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The physiologic consequences of aging have been the subject of increasing study in recent years, but the particular effects on the respiratory system are most notable for their paucity in the group over 65 years of age. Early clinical observations indicated that normal standards of respiratory frequency taken from young adulthood were not applicable to older populations (1), and back in the 19th century there was an appreciation of the significance of slight alterations in the gaseous metabolism (2, 3). It would appear that some of these findings have been lost sight of—particularly, the normal effect of aging on the simplest of all respiratory measurements, the frequency of breathing. Earlier textbooks of physiology devoted large sections to discussions of how many inspirations a minute were taken by a normal adult, but only rarely was age considered as a partial determinant (4). Modern textbooks of physiology, medicine, and physical diagnosis pay scant attention to this measurement; most do not mention it.

Information on ventilation in older age groups is incomplete for ages over 65 (5, 6) and there are no complete data on the response to carbon dioxide This is particularly important, since clinical observation fosters the impression that, under stress, respiratory response in the aged is less than in younger patients. Drugs which affect the respiration are recognized as a particular hazard, and sleep itself may profoundly alter the normal respiratory rhythm of older subjects.

To establish some of the normal ranges for common respiratory measurements in the aged and to begin an investigation of the particular problems they pose in this field, the following study was undertaken.

METHODS

Thirty subjects over 66 years of age were studied. The age groups and further details are listed in Table 1, and comparison is made with similar studies on younger persons in this laboratory and the data of others. All subjects were ambulatory and were hospitalized for causes other than diseases of the pulmonary or cardiovascular system. A few had hypertension with cardiac enlargement and were maintained on digitalis, but none had clinical signs of congestive failure at the time of the study. In 2 of the 30 patients over 66 years of age the degree of obstructive emphysema was significant.

The experimental procedure was as follows: The subjects were seated comfortably in a semi-reclining canvas beach chair, and the entire breathing test explained in detail. After a ten to fifteen minute rest period, a rubber mouthpiece was fitted and a nose clip was attached. The mouthpiece was connected to a two-way check valve, the input of which led from a Douglas bag with an appro-

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TABLE 1

Mean Respiratory Values for Male Subjects Studied at Rest while Breathing Room Air or Pure Oxygen

Age group (10 subj. in each)	Body surf. area (M^2)	Resp. freq. (breaths/min.)	Minute vol.* (liters/min.)	Minute vol.* (liters/min/M^2)
I. 20–29 yrs., mean 24.9†...	1.91	11.4	6.76	3.54
II. 32–38 yrs., mean 35.1†...	1.96	13.3	7.51	3.87
III. 41–48 yrs., mean 44.5†...	1.93	15.5	8.12	4.21
IV. 66–75 yrs., mean 70.9....	1.81	19.1	11.20	6.23
V. 76–85 yrs., mean 80.8....	1.74	18.0	10.47	6.20
VI. 86–94 yrs., mean 88.6....	1.69	20.2	9.63	5.90
Δ %‡	−10%	+43%	+41%	+58%

* Corrected to BTPS.

† Data from Robinson (5).

‡ Change in %, comparing the mean of the three groups over 66 (IV, V, VI) with the mean of the three adult groups under 48 years (I, II, III).

priate gas mixture, and the outlet of which led to a gas meter. The respiratory rate was either counted from observation directly or from a chest pneumograph recorded on moving paper.

The inspired gas mixtures employed were: room air, 100 per cent oxygen, 3 per cent CO_2 in 97 per cent oxygen, and 5–6 per cent CO_2 in 94–95 per cent oxygen. These mixtures were breathed for fifteen-minute periods and recordings of respiratory frequency and expired volume were made continuously. However, only the mean minute volumes calculated from the last five minutes of the fifteen minute test run were utilized. In instances in which very old subjects were unable to breathe the CO_2 mixtures for the full period of time, the last several minutes which appeared to approximate a steady state were used.

All volumes were corrected to body temperature and pressure, saturated with water vapor.

RESULTS AND DISCUSSION

Respiratory frequency and minute volume: Table 1 summarizes the mean data obtained at rest. It is clear that, as a group, the standards of normal are considerably different in the aged. When "normal" is defined as the mean of all adult groups from age 20 to 48 years, the aged appear to have a rather gross hyperventilation, the percentile increase in frequency and minute volume being about proportionately equal. When the individual data are plotted graphically, it appears that the development of the hyperventilation pattern is progressive and directly proportional to the age. This is illustrated in Figures 1 and 2 which may also be consulted for the range of response not indicated in Table 1. The scatter suggests that the most abrupt change may occur at age 65. This change cannot be ascribed to a hypoxic drive, since resting figures on all patients over age 66 were recorded while breathing 100 per cent O_2. Comparison of the ventilation values while breathing room air or 100 per cent oxygen revealed no difference,

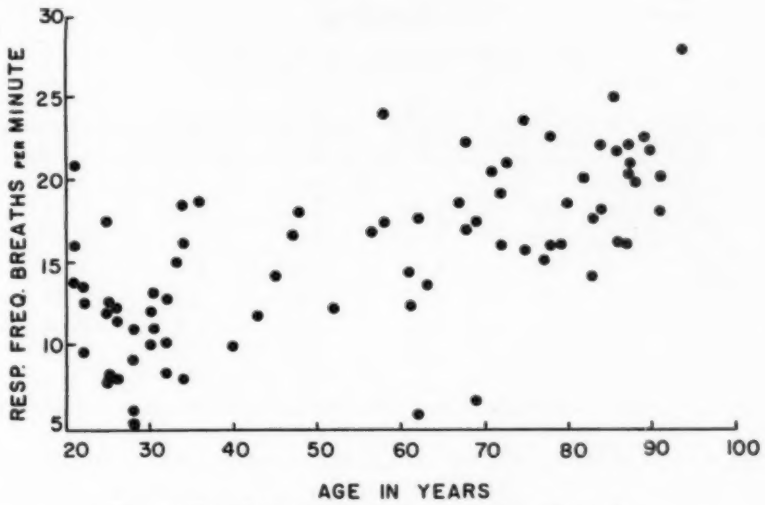

FIG. 1. Respiratory frequency as a function of age.

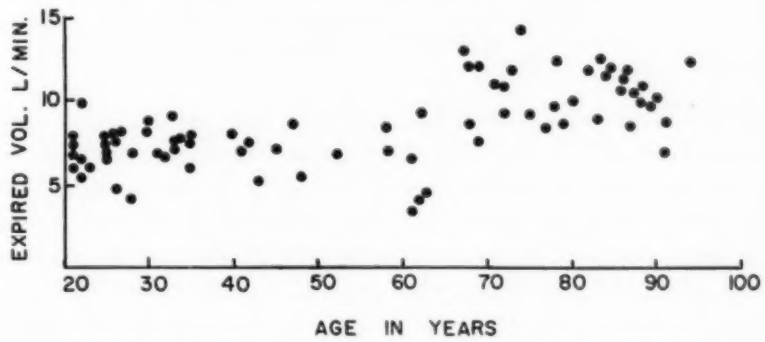

FIG. 2. Minute volume of ventilation as a function of age.

and it is concluded that the hypoxic drive does not play a significant role in the aged.

Our data support the observations of Charcot (1) many years ago. In his discussion of the general features of senile pathology he pointed out that in old men there is an increased respiratory rate. He also mentioned a decrease in CO_2 production, and a fall in vital capacity. Others have thought that in line with the general metabolic depression there is a decrease in respiratory frequency, but give no data (7, 8). The increase in expired minute volume of ventilation of the aged is of great interest. These values are in excess of normal limits defined for young subjects from a variety of laboratories (9–12). The acid-base aspect of respiratory homeostasis may be defined in terms of the tension of carbon dioxide of the arterial blood (and alveoli), and this is inversely proportional to the level of alveolar ventilation but varies directly with metabolic CO_2 production. If it is assumed that the anatomic dead space remains constant (150 cc.) throughout adult life, dead-space ventilation will increase directly as the respiratory frequency increases (Table 2, column 3); but from the data it is clear that the minute volume has increased to an even greater extent, thus suggesting that alveolar

TABLE 2

Calculated Ventilation Values (Mean)

Age group (yrs.)	(1) Vol. of assumed dead space (cc.)	(2) Alveolar ventil.* (L/min./M²)	(3) Dead-space ventil.† (L/min./M²)	(4) Assumed alveolar ventil. (L/min./M²)	(5) Dead-space ventil.‡ (L/min./M²)	(6) Vol. dead space§ (cc.)
I. 20–29	150	2.63	.91	2.8	.74	122
II. 32–38	150	2.81	1.06	2.8	1.07	156
III. 41–48	150	3.00	1.21	2.8	1.41	175
IV. 66–75	150	4.60	1.63	2.8	3.43	325
V. 76–85	150	4.54	1.66	2.8	3.40	330
VI. 86–94	150	4.09	1.81	2.8	3.10	275

* Dead-space volume assumed constant. Alv. ventil. = minute vol. − (resp. freq. × 150 cc.).

† Dead-space ventilation (L/min./M²) = minute volume expired − alveolar ventilation.

‡ Alveolar ventilation assumed constant (2.8 L/min./M²). Dead-space ventil. = minute vol. − 2.8.

§ Calculated from column 5, in which alveolar ventilation assumed constant.

$$\text{Vol. dead space} = \frac{\text{minute vol.} - 2.8}{\text{Resp. freq.}}$$

ventilation may also increase with age (Table 2, column 2). Other things being equal, this increased level of alveolar ventilation would lower the alveolar CO_2 tension to 28 mm. Hg (if normal is 40). Knowing, however, that the alveolar CO_2 tension is normal in old age (5, 13) this suggestion is untenable; indeed, it is the more so when one recalls that metabolic CO_2 production is decreased in the old age group (2, 3, 14). The inescapable conclusion is that dead-space ventilation has increased in excess of that due to the rate increase alone. The magnitude of this increase may be approximated and is indicated in column 5 of Table 2, utilizing the assumption that alveolar ventilation remains constant. Although part of this effect may be ascribed to the anatomic changes of kyphosis and senile emphysema, it is unlikely that it is all from this source. One possibility is that the aged lung includes many alveoli which are perfused with less than the optimal quantity of blood. Since these areas may be normally ventilated but are unable to exchange respiratory gases for want of a circulation, the net effect is similar to adding to the dead space. It is to be expected that if this is true the effect will be similar to a pulmonary arterio-venous shunt, and an alveolar-arterial CO_2 tension gradient will develop. There is some evidence that this is true (5). Table 2, column 6, lists the calculations which may be made to approximate the increase in dead-space volume under the assumptions chosen. A minimal estimate suggests a twofold increase in this volume.

Ventilatory response to CO_2: Figure 3 illustrates the ventilatory response to carbon dioxide. It is to be noted that under the stress of CO_2 all the age groups studied fall into a range which has been determined from several reports on young adults aged 20 to 35 (5, 15, 16, 17). Only the very aged (86–94 years) tend to fall short of the predicted range on 5.8 per cent CO_2, and it is possible that this may be partially ascribed to technical difficulties. These would include

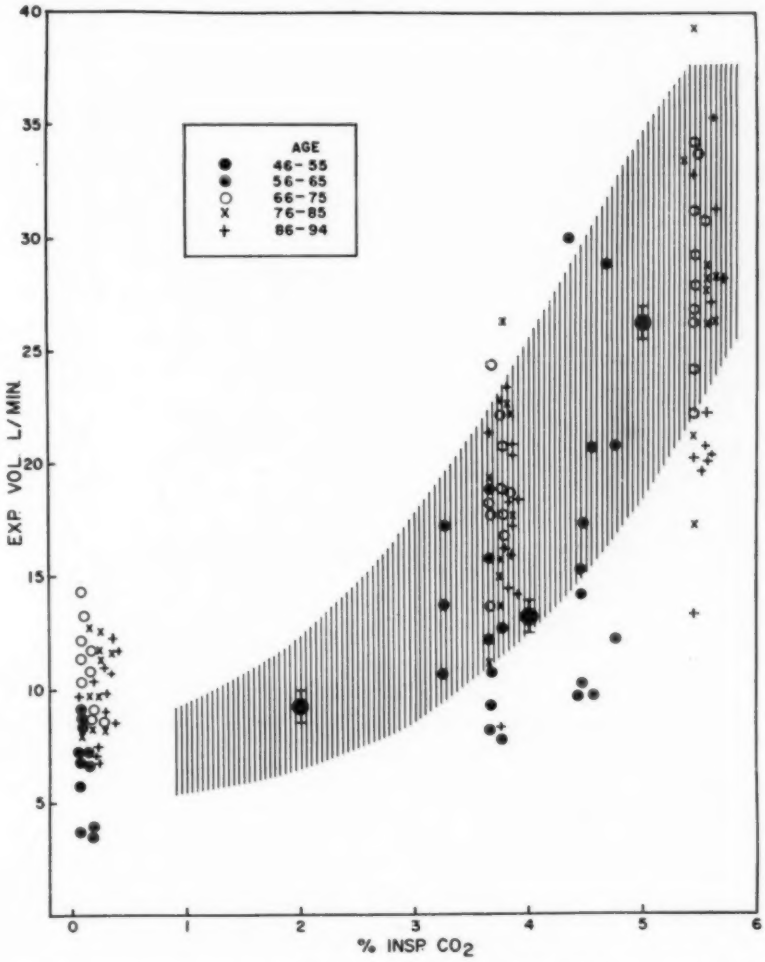

FIG. 3. Ventilatory response to inspired carbon dioxide in different age groups. Hatched area represents range of response previously determined in younger subjects. Large dots represent mean values from data on young subjects of Dripps and Comroe. Bars indicate standard error of the mean on either side of the mean.

inability to tolerate hyperventilation to attainment of a steady state, and difficulty in holding a mouthpiece tightly in place. Although the aged achieve the same absolute ventilation volume under CO_2 drive as young men, it is to be remembered that they start at a higher resting ventilation level (no CO_2 in inspired air). If the "sensitivity" of response is considered, in this instance, as the increment in expired volume per unit increase in inspired CO_2, the aged then must have slightly decreased "sensitivity." This change is on the whole not impressive and emphasizes how different the physiologic processes of senile emphysema are from the natural history of obstructive emphysema in this regard (18). The adequate response to CO_2 as a measure of the "excitability" of the respiratory center may be taken as another instance of the more general maintenance of neuromuscular excitability in the aged in the absence of pathologic conditions of the nervous system (19).

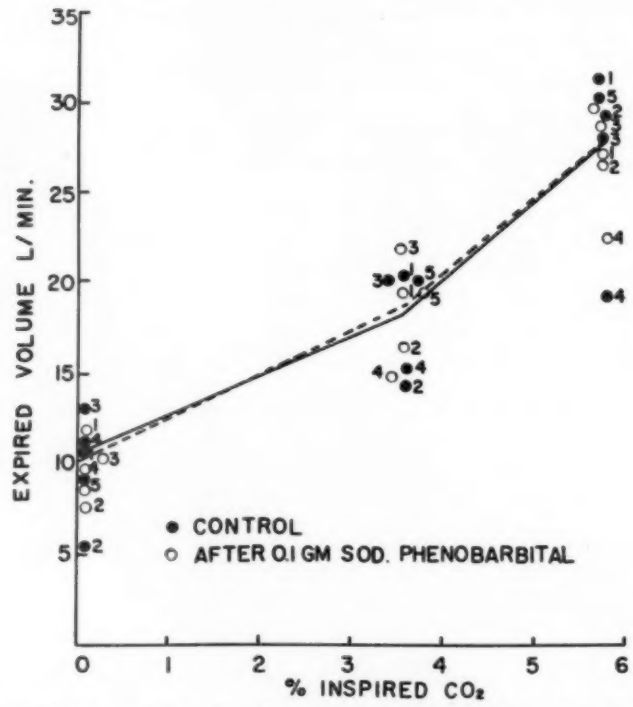

FIG. 4. Individual minute volumes of ventilation from 5 normal male subjects between the ages 74–90 years, before and twenty minutes after subcutaneous administration of sodium phenobarbital. Solid line is best mean control value line. Dotted line is best mean value line after administration of the drug.

Effect of phenobarbital and morphine: Because it is clinically established that hypnotic and narcotic drugs commonly have adverse effects in old patients, it was decided to test a representative of each on the respiratory response of 5 selected patients. These 5 subjects had a mean age 81.4 years (range 74–90). Respiratory measurements while breathing air, oxygen, and the two different CO_2 mixtures as described under "Methods" were made, then the drug was administered subcutaneously and twenty minutes later the respiratory measurements were repeated in their entirety. Sodium phenobarbital in a dose of 0.1 Gm. was the hypnotic agent. A week later the same group was restudied in the same manner, only at this time .010 Gm. of morphine sulfate was administered subcutaneously. The results are indicated in Figures 4 and 5. In 1 patient Cheyne-Stokes breathing developed while under the influence of each drug but this arrhythmia disappeared while breathing the CO_2 mixtures.

It is a little surprising to see that, under the conditions of these observations, age per se apparently did not constitute an added hazard to the administration of drugs which are known to be respiratory depressants. There was no significant difference in respiratory frequency or expired volume under phenobarbital compared to the control. The depressant action of morphine is well defined. Respiratory frequency and minute volume decreased by 10 per cent, but this is not significantly greater than the decrease seen in young subjects (20), and in no way approximates the profound effects seen in patients with obstructive emphysema

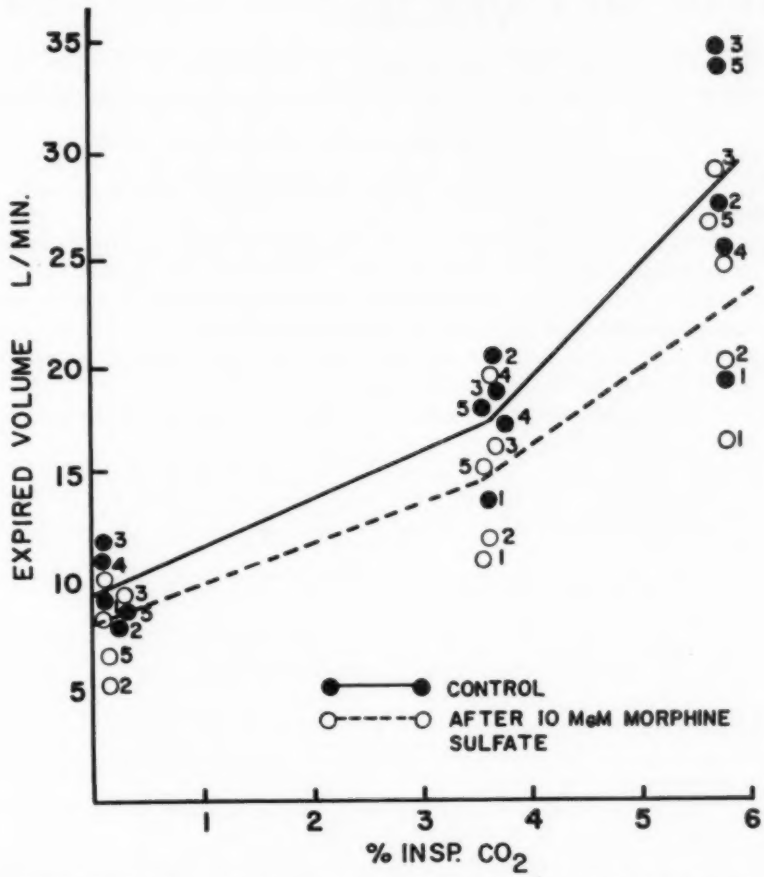

FIG. 5. Individual minute volumes of ventilation before and after morphine sulfate. Subjects and convention same as in Figure 4.

during treatment with narcotics (21). It should be emphasized, however, that these experiments do not indicate possible deleterious effects following prolonged administration. Even more important is the probability that respiratory depressant effects will be potentiated if sleep supervenes, since sleep itself, particularly in the aged, introduces alterations in the normal control mechanisms.

SUMMARY

Normal ventilation and respiratory frequency values have been obtained in 30 subjects between 66 and 94 years of age. This age group is characterized by a pattern of apparent hyperventilation compared to that in younger subjects, but it is concluded that the excess is due solely to an increase in dead-space ventilation, the possible origin of which is discussed.

Ventilatory response to carbon dioxide in the aged reveals a slightly decreased "sensitivity" compared to that in young subjects, although the absolute ventilation volumes achieved are equivalent.

The respiratory actions of sodium phenobarbital and morphine sulfate have been studied in the aged.

Acknowledgment

The authors acknowledge with thanks the kind cooperation of Dr. Eric S. Green in making available to them the facilities and patients of the Monroe County Hospital.

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Abstracts of Current Literature

ARTERIOSCLEROTIC MUSCULAR RIGIDITY WITH SPECIAL REFERENCE TO GAIT DISTURBANCES. CLINICO-ANATOMIC STUDY OF TWO CASES.

Bruetsch, W. L., and Williams, C. L. *Am. J. Psychiat.* **3:** 332 (Nov.) 1954.

Arteriosclerotic muscular rigidity is described and 2 cases with postmortem examinations are presented. The outstanding symptoms were a disturbance of equilibrium and of gait. It is concluded, from a study of these cases, that the syndrome results from a partial involvement of various systems (fronto-ponto-cerebellar tract, pyramidal and extrapyramidal system) and not from an affection of one or two special cerebral centers.

DIVERTICULITIS AND CARCINOMA OF THE COLON. DIFFERENTIAL DIAGNOSIS.

Colcock, B. P., and Sass, R. E. *Surg., Gynec. & Obst.* **99:** 627 (Nov.) 1954.

Diverticulitis and carcinoma of the colon occur in patients of the same age group, usually affect the same segment of the colon, are frequently associated with varying degrees of obstruction, and may present an identical clinical picture. Roentgenologic examination will establish the diagnosis in most patients, but in an appreciable number a definite diagnosis cannot be made on barium enema examination. In these, a careful review of the history may help to establish a presumptive diagnosis of diverticulitis or carcinoma. Certain characteristic differences are pointed out in the symptomatology of 50 patients who required resection of the sigmoid colon because of diverticulitis and 50 patients in whom the lesion in the sigmoid was carcinoma. Thus, the incidence of abdominal pain and of colic-like pain was significantly higher in patients with diverticulitis. The incidence of rectal bleeding was higher in patients with carcinoma. Nausea and vomiting, and chills and fever, were more frequently found in patients with diverticulitis, and constipation more frequently in patients with carcinoma. The duration of symptoms was longer in patients with diverticulitis. The incidence of an abdominal or pelvic mass felt by rectum was the same in both groups, but abdominal or rectal tenderness was more common in patients with diverticulitis. Laboratory data and proctoscopic examinations were of little value in the differentiation. A review of operative findings indicates that it is frequently difficult to distinguish between these lesions even when the process is exposed at operation. In the groups studied, a greater number of patients with diverticulitis had perforation with abscess formation. Thirty-four per cent of this group showed evidences of fistulous formation between the colon and the vagina or between the colon and the bladder or small bowel, whereas only 1 patient with carcinoma had a fistula between the colon and bladder.

PROBLEMS IN THE MANAGEMENT OF RHEUMATOID ARTHRITIS.

Davison, S. *J. Mt. Sinai Hosp.* **21:** 165 (Nov.–Dec.) 1954.

Fourteen case histories illustrate various aspects of the management of rheumatoid arthritis. Gold, rather than corticosteroids, is recommended in early acute progressive disease. One remission and 1 instance of significant improvement with gold therapy are reported. It was ineffective in 4 patients and discontinued because of toxicity in 2. Ten of the patients received corticosteroids systemically. Side effects did not force the permanent discontinuance of either cortisone or hydrocortisone. Among side effects that occurred were gastric ulcer successfully treated with an ulcer regimen, transient glycosuria, and osteoporosis treated with androgen and estrogen. No cardiovascular complications occurred in a hypertensive patient treated for two years with cortisone. One patient under cortisone therapy had both diabetes mellitus and coronary artery disease. The former was managed with diet and insulin. Hydrocortisone by intra-articular injection permitted a reduction in the oral maintenance dosage of cortisone so that no cardiovascular embarrassment resulted from its use. Cortisone therapy was reinitiated after an acute pyarthrosis

in a rheumatoid joint had been cleared by the use of antibiotics and liquifying enzymes. Two patients were successfully treated with intra-articular hydrocortisone alone. It replaced systemic cortisone for maintenance in another.

MYOCARDITIS.

de la Chapelle, C. E., and Kossman, C. E. *Circulation* **10:** 747 (Nov.) 1954.

A review of selected papers on myocarditis published during the past decade and an analysis of some original data together with personal experiences have been presented. All of these indicate that the clinical diagnosis of myocarditis is made far too infrequently as contrasted with the high incidence of this disease as recognized by pathologists. It is estimated that approximately 10 per cent of all patients coming to necropsy will demonstrate some evidence of myocarditis. The discrepancy between the clinical and the pathologic incidences can possibly be ascribed to two factors, namely, (a) the relatively innocent nature of the clinical and laboratory findings in many cases, and (b) the apparent reluctance of the clinician to make the diagnosis. It is likely that a correct diagnosis of myocarditis will be made more often and cardiac catastrophies avoided if the clinician will consider the possibility of the diagnosis, particularly in the course of all types of infectious diseases. (Authors' summary.)

CHOLESTEROSIS OF THE GALLBLADDER. AN AUTOPSY STUDY OF 165 CASES.

Feldman, M., and Feldman, M., Jr. *Gastroenterology* **27:** 641 (Nov.) 1954.

Cholesterosis of the gallbladder, a noninflammatory condition with intramural deposition of lipoid, appears to be a localized condition due to a disturbance in absorption of cholesterol. Venous and lymphatic stasis has been suggested as an etiologic factor leading to a disturbance in the absorptive or secretory mechanism of the gallbladder mucosa. Among 1,319 adult necropsies, the condition was noted in 165 (12.5 per cent). The disease occurred most frequently in males and in individuals between the fifth and seventh decades of life. Cholecystitis and gallstones were not common findings in coexistence with the disease. The study indicated no causal relationship between the liver and cholesterosis of the gallbladder. Blood cholesterol levels are of no value in the diagnosis. Excessive cholesterol crystals in duodenal drainage material are, however, highly suggestive of the disease.

ATROPHY AND HYPERPLASIA IN THE PROSTATE PROPER.

Franks, L. M. *J. Path. & Bact.* **68:** 617 (Oct.) 1954.

Several types of lesions that take place in the peripheral portion of the prostate gland with increasing age are discussed: 1) Simple atrophy, with or without cyst formation, involves both the epithelium and stroma. It is a benign process probably due to senility. 2) Sclerotic atrophy seems to take place at a later age than simple atrophy (60–65 years). It is usually confined to the prostate proper, in contrast to simple atrophy which also may occur in areas of nodular hyperplasia. The hypothesis that the changes of sclerotic atrophy may be due to an absolute or relative increase in circulating estrogens is under investigation. 3) Post-atrophic hyperplasia may involve areas that have undergone either simple or sclerotic atrophy. Lobular hyperplasia follows simple atrophy and usually involves the whole gland lobule. Post-sclerotic hyperplasia is an irregular process and histologically there is evidence that areas of small-acinar carcinoma may develop from it. 4) Secondary hyperplasia is relatively common and may involve groups of acini, single acini, or part of an acinus or atrophic cyst. This type of change is only casually associated with prostatic carcinoma, although similar changes have sometimes been considered precancerous. It probably indicates residual activity in areas of a gland that is elsewhere atrophic. Benign nodular hyperplasia, when it occurs, seems to have no direct association with these changes in the outer gland group.

MUCINOUS ADENOCARCINOMA OF THE URACHUS: REVIEW OF THE LITERATURE AND REPORT OF A CASE.

Garvey, F. K., and Nunnery, W. E. *J. Urol.* **72:** 860 (Nov.) 1954.

No theory as yet satisfactorily explains the presence of mucinous type cells in urachal tumors. Silent hematuria is the most common and often the only symptom. There may be a tender suprapubic mass, dysuria, frequency and pyuria. In rare instances, masses of gelatinous mucin appear in the urine. Cystoscopic visualization is possible except in cases in which the tumor is limited to a urachus that does not communicate with the bladder, and then an indentation of the bladder dome is usually evident. Any lesion in the bladder dome should be suspected, but the most frequent finding is a ragged, poorly outlined, papillary mass of friable pink tissue. Careful abdominal palpation, bimanual examination, cystography, and cystoscopic biopsy complete the diagnostic procedures. Treatment consists of radical excision. The results of radiation therapy have been unsatisfactory. The pathology of the lesion is discussed and 1 case is reported, which brings the total of those recorded to 50. Too little clinical information is available to allow conclusions as to malignancy, the site and incidence of metastases, the radiosensitivity of the tumors and their prognosis. An occasional patient has survived for ten years after removal of the tumor. Most deaths attributable to urachal carcinoma have occurred in less than five years. It is urged that every recognized case be carefully studied and diligently followed in order that knowledge of these tumors may be increased.

THE SCOPE OF RADICAL SURGERY IN THE TREATMENT OF MALIGNANT TUMORS OF THE EXTRAHEPATIC BILIARY TRACT.

Glenn, F., and Hays, D. M. *Surg., Gynec., & Obst.* **99:** 529 (Nov.) 1954.

A study of 103 carcinomas of the extrahepatic biliary tract, *i.e.*, gallbladder, biliary ducts, and ampulla, treated during a 21-year period is presented. The influence of the adoption of a policy of radical resection on the prognosis in these patients is analyzed, with the following conclusions: In cases of carcinoma of the ampulla of Vater, pancreatoduodenectomy or similar more extensive radical resection is indicated in all individuals in whom excision of the gross tumor seems initially possible. Although the immediate postoperative mortality and complication rates are high, the palliation provided those patients who survive is longstanding and effective. Ascending cholangitis has not been a clinical problem but is the usual autopsy finding. The absolute curability is probably not greatly affected. Resections known to be palliative seem justified in selected cases. The prognosis in patients with carcinoma of the gallbladder and extrahepatic biliary ducts is not greatly improved by the adoption of radical surgical procedures. Prophylactic cholecystectomy for all patients in the older age group with symptomatic biliary-tract disease can be justified on the basis of the dangers of malignancy. This procedure appears to be the most reasonable line of approach to the problem. (From authors' summary and conclusion.)

PROGNOSIS IN CANCER OF THE UTERINE CERVIX BASED ON THE VAGINAL SMEAR BEFORE TREATMENT. SR—THE SENSITIZATION RESPONSE

Graham, J. B.; Graham, R. M., and Liu, W. *Surg., Gynec. & Obst.* **99:** 555 (Nov.) 1954.

From a study of vaginal smears taken from patients with a stage I or II cancer of the cervix prior to treatment, it is concluded that the sensitization response (SR) is a useful prognostic index and may serve in the selection of the appropriate form of treatment. The sensitization response is a change found principally in the basal cells of the vaginal smear in some patients with cancer of the cervix. The alteration is seen as a cytoplasm that is finely vacuolated and simultaneously increased in density. It stains a deep lavender with

Papanicolaou polychrome stain. The proportion of basal cells is of limited prognostic value but follows the same general trend as SR. The evaluation of 50 vaginal smears by 10 observers demonstrated a high degree of reproducibility in both. Studies of 136 patients treated radiologically and 103 treated surgically are presented. A marked SR and, to a less extent, an abundance of basal cells indicated a favorable prognosis for radiologic therapy and a poor prognosis for surgery. The opposite was found for patients with a poor SR; the salvage rate was significantly better in the surgical group than in the radiologic group.

ÉTUDE CHEZ LE VIEILLARD DES ÉLECTROLYTES K ET Na ET DE LA PRESSION OSMOTIQUE DU PLASMA PAR LE DELTA CRYOSCOPIQUE (STUDY IN ELDERLY INDIVIDUALS OF THE ELECTROLYTES K AND Na AND OF THE OSMOTIC PRESSURE OF THE PLASMA BY THE CRYOSCOPIC METHOD).

Herveuval, R.; Cuny, G., and Manciaux, M. *Presse méd.* **62:** 1555 (Nov. 13) 1954.

Potassium and sodium levels were determined in the blood of individuals 60 to 94 years of age. The 208 determinations of potassium were made in 109 men and 99 women, all with satisfactory renal function. One hundred and thirty-four determinations of blood sodium were made. The results showed a slight hyperkaliemia (4.72 mEq./L) in comparison with the value in normal adults (4.5 mEq./L). The degree of elevation apparently paralleled the age and was unaffected by sex. No significant modification was found in the blood sodium level of elderly individuals, although there was a tendency to hyponatremia. No modifications in plasma osmotic pressure were found by the cryoscopic method in individuals aged 60 to 90 years.

POSSIBLE SIGNIFICANCE OF THE PROSTATIC SECRETION ACID PHOSPHATASE AS A DIAGNOSTIC AND A PROGNOSTIC INDEX IN CARCINOMA OF THE PROSTATE.

Muhsen, J. *J. Urol.* **72:** 928 (Nov.) 1954.

A simple laboratory method to diagnose carcinoma of the prostate is described. The marked reduction in the level of acid phosphatase in the prostatic secretion following stilbestrol administration in carcinoma of the prostate may be of value in diagnosing carcinoma of the prostate, since no such striking reduction in this level could be demonstrated in nonmalignant glands. This simple test may be useful also to determine the androgenic activity of various synthetic estrogens, and to detect the cases of carcinoma of the prostate which are resistant to anti-androgen treatment, so that other more effective treatment can be instituted. (From author's summary.)

MEDICAL TREATMENT OF DEGENERATIVE ARTHRITIS OF THE HIP JOINT.

Manning, R. A., and Pierik, M. G. *Rhode Island M. J.* **37:** 609 (Nov.) 1954.

No improvement was noted in actual joint range of motion or x-ray pictures in any of 34 patients with osteoarthritis of the hip joint during long-term medical management. The only symptom benefited was pain, and parenteral testosterone propionate was most effective in this respect. Phenylbutazone was also effective but side actions prohibited its use for the long periods required in treatment of arthritis of the hip joint. Other medications used included salicylates, vitamins A and D, and intra-articular hydrocortisone. The relief of pain in osteoarthritis aids in keeping the patient ambulatory. Ambulation helps to maintain adequate muscle strength needed for proper breaking-in of the joint in patients who have undergone arthroplasty.

THE CONTROL OF DICUMAROL THERAPY IN MYOCARDIAL INFARCTION BY A SIMPLE BLOOD PROTHROMBIN TEST.

Manchester, B., and Rabkin, B. *Circulation* **10:** 691 (Nov.) 1954.

The control of Dicumarol therapy in acute myocardial infarction by a simple capillary blood prothrombin test has proved convenient, practical, and economical. It was possible to administer anticoagulant therapy to 150 patients with myocardial infarction at home and in the hospital. An additional 150 subjects who did not receive anticoagulants served as controls. Except for Dicumarol, alone or with heparin, both groups followed the same regimen and received the same medication. Mortality in the anticoagulant group was 12 per cent; in the control group it was 28 per cent. Among 33 subjects in the "good risk" group treated with Dicumarol, there were 3 deaths (9.1 per cent), whereas among 47 of the good risks in the control group, the mortality was 6 (12.8 per cent). The mortality among 117 cases of the "poor risk" anticoagulant group was 15 (12.8 per cent). Among the poor risks of the control group of 103 cases, there were 36 deaths (35 per cent). Thromboembolic complications developed in 9 (6 per cent) of the treated patients as against 26 (17.3 per cent) in the control group. Death due to pulmonary embolism occurred in 1 subject (0.66 per cent) in the treated group and in 12 (8 per cent) in the control group. Two of the deaths in the latter group occurred among the good risks. The prognosis in the poor-risk group with two or more myocardial infarctions treated with Dicumarol was better than among poor risks of the control group. Hemorrhagic complications were noted in 16 (10.6 per cent) of the treated and in 2 (1.33 per cent) of the control group. The advantages of Dicumarol therapy, properly administered, were greater than all the disadvantages reported to date. The value of the simple blood prothrombin test employed for the control of Dicumarol therapy is reflected in the therapeutic efficacy and safety noted in this series. The results compare favorably with those of other investigators using other prothrombin tests. (From authors' summary.)

THE EFFECT OF CORTATE AND OF DRAMAMINE ON A SELECTED GROUP OF PATIENTS UNDERGOING DEEP ROENTGEN THERAPY FOR CARCINOMA OF THE CERVIX UTERI.

Lasser, E. C., and Stenstrom, K. W. *Am. J. Roentgenol.* **72:** 827 (Nov.) 1954.

Dramamine, 50 mg. orally three times daily on the tenth through thirteenth days of treatment and on the twenty-first and twenty-second days, caused some diminution in the eosinophil response of a group of patients receiving deep x-ray therapy for carcinoma of the cervix. Little recognizable alteration occurred in the pattern of adrenocortical response or in the pattern of symptomatic radiation sickness. Cortate, 5 mg. intramuscularly on the same treatment days, appeared to modify the response of the adrenal cortex, the development of peripheral eosinophilia, and the development of symptoms of radiation sickness. In both of these groups and in the control group (total 50 patients), premenopausal patients showed less evidence of radiation sickness than postmenopausal patients. The role of estrogens in modifying the response to irradiation in the two groups is as yet unknown.

CANCER OF THE LUNG. A REVIEW OF EXPERIENCES WITH 1,457 CASES OF BRONCHOGENIC CARCINOMA.

Ochsner, A.; Ray, C. J., and Acree, P. W. *Am. Rev. Tuberc.* **70:** 763 (Nov.) 1954.

Cancer of the lung is increasing at a higher rate than any other cancer in the body; and is due, the writers believe, to the carcinogenic effect of cigarette smoking. It is a disease primarily of men, principally in the sixth and seventh decades of life. Approximately half of bronchogenic cancers are epidermoid; 31 per cent, undifferentiated; and 19 per cent, adenocarcinomas. The bronchi of the upper lobe are involved more frequently than any

other. Any man past 40 years of age who has been a heavy smoker should be suspected of having bronchogenic cancer if he has unexplained thoracic discomfort. Viral pneumonitis should be viewed with suspicion in all such persons, because of the likelihood that an associated infection in bronchogenic cancer can simulate viral pneumonitis. The diagnosis of bronchogenic cancer is usually not difficult if the physician will only think of the possibility of its existence. All men past the age of 40 who have been heavy smokers should have a routine chest roentgenogram at least every six months. All shadows should be considered suspicious of carcinoma. Bronchoscopy makes a positive diagnosis in only approximately a third of all cases. By cytologic examination of the sputum, a correct diagnosis can be made in approximately 68 per cent of cases. In 20 per cent of instances, it is necessary to resort to thoracic exploration in order to make a diagnosis. In a series of 1,457 cases, 789 were considered operable; 723 were explored and a resection was possible in 469. There was an operative mortality rate of 19 per cent. Palliative resection was performed in 73 per cent of the cases. The fact that the tumors were resectable in only 32 per cent of patients at the time they were first seen was undoubtedly due to the fact that there had been a long delay, an average of 8.7 months, from the onset of the first symptoms until therapy was instituted. Of the patients who had resections, 13.5 per cent were alive at the end of five years, apparently free from the disease. Since only 85 per cent of the general population 60 to 70 years old without cancer of the lung are alive, the results are better than they appear. Of the patients who had extensive involvement and in whom palliative resection was performed, 6.6 per cent were alive at the end of five years. In a group of patients in whom no resection was carried out, only 17 per cent survived six months and only 1 per cent were alive at the end of two years, even though other palliative therapy such as nitrogen mustard or irradiation was used. It is obvious that, in order to increase the salvage rate in bronchogenic cancer, the diagnosis must be made earlier. This can be accomplished only by obtaining routine chest films at least every six months in men who have been heavy smokers. (From authors' summary.)

THE SAFETY OF WATER IRRIGATION IN TRANSURETHRAL PROSTATECTOMY.
Pitts, H. H., and Hinman, F., Jr. *J. Urol.* **72:** 925 (Nov.) 1954.

A study of 8 cases of renal shutdown (5 temporary and 3 permanent) in 509 resections of the prostate suggests that hemolysis by water as an irrigating fluid is not a critical factor in anuria or oliguria. Severe blood loss with hypotension and shock are more frequently implicated. Resection of large glands with thinned surgical capsules more often involves opening into venous sinuses. This explains the preference for a nonhemolytic solution by skilled resectionists, but does not mean that it is needed for the smaller adenoma enclosed in a thicker prostate. Nonhemolytic irrigating solutions tend to obscure vision, making identification of exact tissue planes more difficult, especially for the occasional resectionist. The use of water as the routine irrigating solution for transurethral resections will be continued because the advantages of good visibility seem to outweigh the dangers of hemolysis (Authors' summary and conclusions.)

MANIFESTATIONS OF HODGKIN'S DISEASE OF THE GASTROINTESTINAL TRACT.
Portmann, U. V.; Dunne, E. F., and Hazard, J. B. *Am. J. Roentgenol.* **72:** 772 (Nov.) 1954.

Hodgkin's disease is sometimes first manifested in the gastrointestinal tract. The literature on Hodgkin's disease of the gastrointestinal tract is reviewed. The lesions involving the esophagus, stomach, small intestine and colon are considered separately as to site, gross pathology, roentgenologic diagnosis, treatment and prognosis. Eight cases of Hodgkin's disease of the gastrointestinal tract are reported. The first manifestations appeared in the stomach in 6 patients, in the jejunum in 1, and in the ileocecal region in 1. Experience with these patients and with those reported in the literature indicates that lengthy

survival periods can be achieved by resection in favorable cases, with or without radiation, even when limited lymph-node metastasis is demonstrated.

ARGENTAFFIN TUMOR (CARCINOID) OCCURRING IN A BENIGN CYSTIC TERATOMA OF THE TESTICLE.

Simon, H. B.; McDonald, J. R., and Culp, O. S. *J. Urol.* **72:** 892 (Nov.) 1954.

What is believed to be the first reported case of a carcinoid tumor arising within a benign cystic teratoma of the testicle is described in detail, both clinically and pathologically. The extreme rarity and benign nature of the lesion are emphasized. (Authors' summary.)

PANCREATIC DUCT HYPERPLASIA AND CANCER.

Sommers, S. C.; Murphy, S. A., and Warren, S. *Gastroenterology* **27:** 629 (Nov.) 1954.

Hyperplasia of the pancreatic duct accompanied 58 of 141 (41 per cent) pancreatic carcinomas examined at autopsy. Hyperplasia was of the papillary or adenomatous type. Comparable hyperplastic changes were found in the pancreatic ducts of 9 per cent of 150 non-neoplastic control cases, and in 28 per cent of a separate series of 100 cases with diabetes mellitus. In 4 cancer cases, carcinoma in situ was also observed. Analysis of 304 cancers from other sites, found at autopsy to be associated with pancreatic duct hyperplasia, indicated that rectosigmoid carcinomas in males were disproportionately numerous. Among persons with multiple primary cancers and hyperplasia of the pancreatic duct, 36 per cent had involvement of endocrine-stimulated organs and the gastrointestinal tract. (From authors' summary.)

CLINICAL RESULTS OF THE TREATMENT OF PROSTATIC CARCINOMA OVER A TEN-YEAR PERIOD.

Staubitz, W. J.; Oberkircher, O. J., and Lent, M. H. *J. Urol.* **72:** 939 (Nov.) 1954.

One hundred and twenty-two cases of histologically proved carcinoma of the prostate studied over a ten-year period are presented. The incidence of the disease was greatest in the 60–80 year age group, the average age of the patients being 67.5 years. The predominant symptoms were frequency, nocturia and pain. Adenocarcinoma was the most common pathologic type and responded best to androgen-control therapy. Acid phosphatase levels were elevated initially in 47 patients (38.5 per cent) and normal in 63 (51.6 per cent). No determinations were made in 12 patients. Acid phosphatase was significantly reduced by androgen-control therapy in 26 (36.6 per cent) of 71 patients in whom serial determinations were made. Patients treated by androgen-control methods had a five-year survival of 56.5 per cent and a ten-year survival of 20 per cent, compared with 10.8 and 2.7 per cent, respectively, in untreated patients. Survival rates were greatest following the use of estrogens and orchiectomy in combination. This combination initially is the treatment of choice.

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The Roosevelt Hotel in New York has set aside a number of rooms to take care of physicians attending this symposium. Those who plan to attend should write to Mr. A. G. Schellenberg, Reservation Manager, Hotel Roosevelt, Madison Avenue at 45th Street, New York 17, New York. Mention that you will attend the symposium and Mr. Schellenberg will be glad to take care of your needs.

The American Geriatrics Society

PROGRAM

GRADUATE SYMPOSIUM ON GERIATRIC MEDICINE

Presented by
THE AMERICAN GERIATRICS SOCIETY

Wednesday, November 30 and Thursday, December 1, 1955
PALM TERRACE SUITE

HOTEL ROOSEVELT

MADISON AVENUE AND 45TH STREET

NEW YORK CITY

Morning Session, Wednesday, November 30

Edward Henderson, M.D., presiding

9:00–10:00

CHEMOPALLIDECTOMY: A NEUROSURGICAL TECHNIQUE USEFUL IN GERIATRIC PARKINSONIANS

Irving S. Cooper, M.D. and Nicolas Poloukhine, M.D.*†—*Assistant Professor of Neurosurgery, New York University-Bellevue Medical Center.† Director, Department of Neurosurgery, St. Barnabas Hospital, New York City.

10:00–10:15

Recess for refreshments

10:15–10:45

OSTEOPOROSIS: DIAGNOSIS AND TREATMENT

Marvin Weinberg, M.D., New York City.

10:45–11:15

SURGERY AND ANESTHESIA AS A TEAM FOR GERIATRIC SURGERY

Frank Glenn, M.D. and Joseph Artusio, M.D.*†—*Professor of Surgery, Cornell University Medical College, and Surgeon-in-Chief, New York Hospital. †Associate Professor of Surgery (Anesthesiology), Cornell University Medical College, and Attending Anesthesiologist in Charge, New York Hospital, New York City.

11:15–11:45

THYROID FUNCTION AND DISEASE IN OLD AGE

Thomas H. McGavack, M.D., Professor of Clinical Medicine, New York Medical College, Flower and Fifth Avenue Hospitals, New York City.

11:45–12:15

TREATMENT OF PULMONARY DISEASES IN OLDER PEOPLE

Alvan L. Barach, M.D., Clinical Professor of Medicine, Columbia University, College of Physicians and Surgeons, and Associate Attending Physician, Presbyterian Hospital, New York City.

Afternoon Session, Wednesday, November 30

Laurance W. Kinsell, M.D., presiding

2:00–2:30

A NEW INTRAVENOUS ANESTHETIC WITH REFERENCE TO ITS USE IN ELDERLY PATIENTS

Emery A. Rovenstine, M.D., Professor and Chairman, Department of Anesthesiology, New York University Post-Graduate Medical School, New York City.

2:30–3:00

BREAST CANCER IN THE POST-MENOPAUSAL FEMALE

Frank E. Adair, M.D., Associate Professor of Clinical Surgery, Cornell Medical School, New York City.

3:00–3:30

OBESITY AND DIABETES

C. N. H. Long, M.D., Sterling Professor of Physiology and Chairman, Department of Physiology, Yale University, School of Medicine, New Haven, Connecticut.

3:30–3:45

Recess for refreshments

3:45

PANEL ON HEART DISEASE

Moderator: *Charles T. Stone, Sr., M.D.*, Professor of Internal Medicine, University of Texas, Medical Branch, Galveston, Texas.

David Lehr, M.D., Professor and Director of Pharmacology and Associate Professor of Medicine, New York Medical College, Flower and Fifth Avenue Hospitals, New York City.

Wesley E. Peltzer, M.D., Assistant Clinical Professor of Medicine, University of Utah School of Medicine, Salt Lake City, Utah.

Harold E. B. Pardee, M.D., Associate Professor of Clinical Medicine, Cornell University Medical School, New York City.

Harry Gold, M.D., Professor of Clinical Pharmacology, Cornell University Medical School, New York City.

Robert L. Levy, M.D., Professor of Medicine, Emeritus, Columbia University, College of Physicians and Surgeons, New York City.

Morning Session, Thursday, December 1

Thomas H. McGavack, M.D., presiding

9:00–9:30

DERMATOSES IN THE AGED

Charles Rein, M.D., Associate Professor of Dermatology and Syphilology, New York University Post-Graduate Medical School, New York City.

9:30–10:00

THE MANAGEMENT OF ALLERGIC DISORDERS IN THE GERIATRIC PATIENT

John M. Sheldon, M.D., Professor of Internal Medicine; Director, Department of Post-Graduate Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

10:00–10:15

Recess for refreshments

10:15–10:45

NUTRITION AND THE GERIATRIC PATIENT

Fredrick J. Stare, M.D., Professor of Nutrition, and Chairman, Department of Nutrition, Harvard School of Public Health, Boston, Massachusetts.

10:45–11:15

ACUTE AND CHRONIC CORTICOID THERAPY IN OLDER PEOPLE

Laurance W. Kinsell, M.D., Director, Institute for Metabolic Research, Highland Alameda County Hospital, Oakland, California.

11:15–11:45

INDICATIONS FOR STEROID HORMONE THERAPY IN THE GERIATRIC PATIENT

Robert B. Greenblatt, M.D., Professor of Endocrinology, Medical College of Georgia, Augusta, Georgia.

11:45–12:15

PREDNISOLONE IN THE MANAGEMENT OF LEUKEMIA IN THE ADULT

Joseph M. Hill, M.D., Director, Wadley Research Institute and Blood Center, Dallas, Texas.

Afternoon Session, Thursday, December 1

Edward B. Allen, M.D., presiding

2:00–3:15

PANEL ON RHEUMATIC DISEASES

Moderator: *Walter Bauer, M.D.*, Jackson Professor of Clinical Medicine, Harvard Medical School, and Chief, Medical Services, Massachusetts General Hospital, Boston, Massachusetts.

Russell L. Cecil, M.D., Medical Director, Arthritis and Rheumatism Foundation; Professor of Clinical Medicine, Emeritus, Cornell University Medical School; Consultant Physician, New York Hospital, New York City.

Richard H. Freyberg, M.D., Associate Professor of Clinical Medicine, Cornell University Medical School, and Director, Section on Rheumatic Diseases, Hospital for Special Surgery, New York City.

Joseph Lee Hollander, M.D., Associate Professor of Clinical Medicine, and Chief, Arthritis Section, University of Pennsylvania School of Medicine, and Associate Professor of Medicine, and Chief, Division of Rheumatology, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.

Charles Ragan, M.D., Associate Professor of Medicine, Columbia University, College of Physicians and Surgeons, New York City.

3:15–3:30

Recess for refreshments

3:30–4:00

SOCIAL AND ECONOMIC ASPECTS OF OLD AGE

Clark Tibbitts, Editor, *Aging*, and Chairman, Committee on Aging, Department of Health, Education and Welfare, Washington, D. C.

4:00–4:30

EMOTIONAL NEEDS OF OLDER PEOPLE

David C. Wilson, M.D., Professor of Neurology and Psychiatry, and Chairman, Department of Neurology and Psychiatry, University of Virginia School of Medicine, Charlottesville, Virginia.

4:30–5:30

PANEL ON SOME PSYCHOLOGIC AND PSYCHIATRIC PROBLEMS OF OLD AGE

Moderator: *Edward B. Allen, M.D.*, Westchester Division, New York Hospital, White Plains, New York.

Hollis E. Clow, M.D., Westchester Division, New York Hospital, White Plains, New York.

Clark Tibbitts, Editor, *Aging*, and Chairman, Committee on Aging, Department of Health, Education and Welfare, Washington, D. C.

David C. Wilson, M.D., Professor of Neurology and Psychiatry, and Chairman, Department of Neurology and Psychiatry, University of Virginia, School of Medicine, Charlottesville, Virginia.

1956 ANNUAL MEETING

AMERICAN GERIATRICS SOCIETY

Palmer House, Chicago, Illinois

May 3 and 4, 1956

All Fellows are urged to attend the annual meeting. Make plans early. The Palmer House in Chicago has set aside a number of rooms to take care of Fellows who plan to attend the meeting. Write to Mr. E. M. Langford, Reservation Manager, Palmer House, Chicago, Illinois. Mention that you will attend the annual meeting and Mr. Langford will be glad to take care of your needs.

Would you like to give a paper at the annual meeting? If so, please fill in the coupon below and mail promptly, with an abstract of your paper, about 200 words, to Norris J. Heckel, M.D., Chairman, Program Committee, 122 South Michigan Boulevard, Chicago, Illinois. Your abstract must be in Dr. Heckel's hands before January 1st, 1956.

NAME_____

ADDRESS_____

TITLE OF PAPER TO BE SUBMITTED_____

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ERRATA

In the article entitled "Evaluation of Orally Administered Penicillin" by William P. Boger, published in *J. Am. Geriat. Soc.* **3:** 556–565 (August) 1955, the following two errors in the manuscript should be corrected:

1. Table 1, twelfth item—ammonium penicillin. It should be listed as "soluble" rather than "insoluble."

2. Page 563, at the end of the discussion. The dose in the "single intramuscular injection" should be "600,000 units" instead of "300,000 units."